April 17, 1939

TEEL

DUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882

KEN BEARINGS FOR FASTER,
ORE ACCURATE ROD MILLS

onized rod mill installed at a large mid-west
nds equipped throughout with TIMKEN Bear-
5 rod leaves the 19th stand it is travelling at
speed of 40 miles per hour.

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The same characteristics that have made TIMKEN Tapered Roller Bearings supreme on the roll necks of modern high speed continuous strip and sheet mills distinguish their performance on rod and bar mills.

TIMKEN Bearings assure the extremely close running clearance necessary to hold required gauges accurately, uniformly and constantly.

There is no roll neck friction to hamper speed and consequently faster operation can be maintained at all times. For the same reasons power demands are consistently lower than would ordinarily be expected. Loads of all kinds—radial, thrust and shock—are carried dependably within the bearing itself. No thrust plates or auxiliary supports of any kind needed. Simplified lubrication coupled with the fact that TIMKEN Bearings are entirely self-contained makes roll changing quick and easy. No delicate parts to handle. You can have all of these advantages in new rod or bar mills by making sure that they are Timken Bearing Equipped.

TIMKEN
TAPERED ROLLER BEARINGS

IKEN ROLLER BEARING COMPANY, CANTON, OHIO

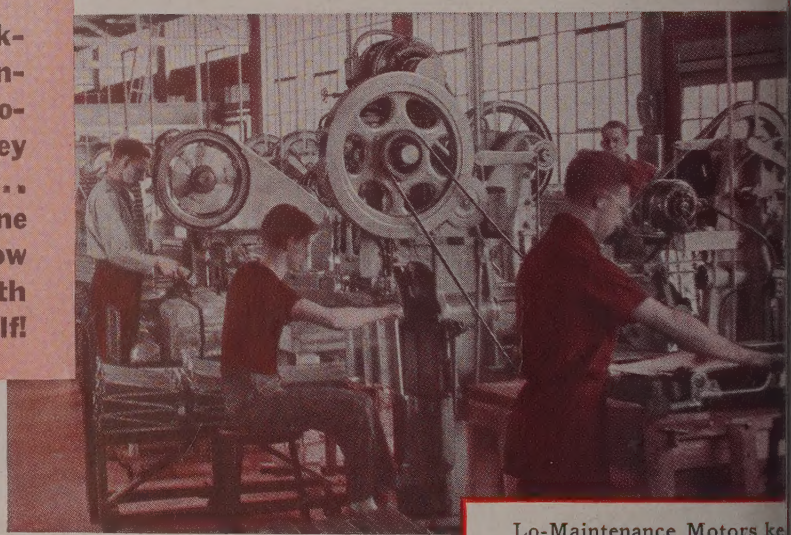
8½ YEAR REPAIR BI

FOR 119 LO-MAINTENANCE MOTO

$000.00!

Another true case hi from the Allis-Chalm files that proves **"IT P TO BUY THE EQUIPME THAT PAYS FOR ITSE**

President H. A. Lockwood, Lockwood Mfg. Co. Tells the Sensational Performance Story of 119 Lo-Maintenance Motors . . . How They Ran Continuously for 8½ Years . . . With No Shutdowns . . . and Not One Cent for Repairs! Find Out How You Can Cut Your Costs . . . with the Equipment that Pays for Itself!



Lo-Maintenance Motors ke duction steady — without up repair bills at the Lo Mfg. Co., Cincinnati, Ohio.

Here's a story that speaks for itself! And it strikes right home to every executive who is interested in keeping his production steady . . . in cutting costs in his plant!

When H. A. Lockwood, president of the Lockwood Manufacturing Company of Cincinnati, bought 119 Allis-Chalmers Lo-Maintenance Motors in May, 1930, he knew from past experience that he was going to get good performance . . . but he never realized the amazing low-cost operating record those motors would set for him!

"We haven't spent one cent for repairs!"

"We feel," said Mr. Lockwood, whose company manufactures bakery pans and supplies, "that our motors are one of the most important parts of our production process. And you can readily see that for us motor failures are costly . . . in wasted operators' time . . . in production losses . . . in maintenance costs.

"That's why we are so enthusiastic about Allis-Chalmers motors. They've done everything you said they would do, and we haven't spent one cent for repairs on any of the 119 motors since we installed them 8½ years ago!"

That's why Mr. Lockwood ordered 33 additional Lo-Maintenance Motors to take care of expansion needs. And that's why in every industry . . . in plants throughout the country . . . executives are switching to Allis-Chalmers! They know the extra margin of full mea struction that makes Allis equipment pay for itself dollars and cents savings.

Put Allis-Chalmers to Work

Find out how 90 years of with industry can work fo can cut your costs . . . workers' jobs easier. Call district office or write direc Chalmers for the whole st equipment that pays for i

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PRODUCTS ENGINEERED TO PAY FOR THEMSELVES

Electrical Equipment • Power Transmission Equipment • Steam and Hydraulic Turbines • Blowers and Compressors • Engines and Condensers • Centrifugal Pumps • Flour and Cereal Mill Equipment • Boiler Feedwater Treatment • Saw Mill and Timber Preserving Machinery • Crushing, Cement, and Mining Machinery • Power Farming Machinery • Industrial Tractors and Road Machinery

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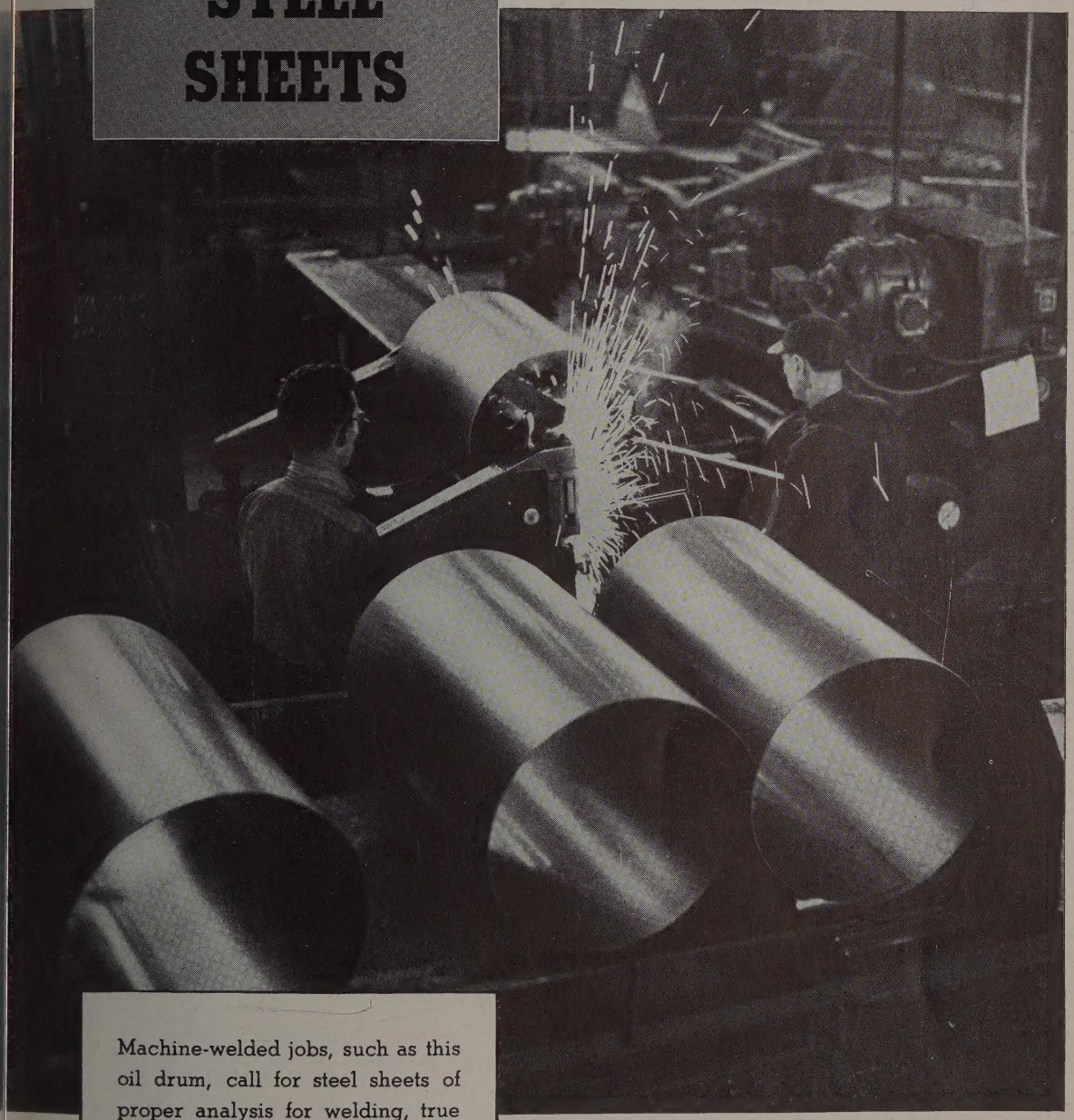
BETHLEHEM STEEL SHEETS ...for welding



Machine-welded jobs, such as this oil drum, call for steel sheets of proper analysis for welding, true to gage and accurately sheared. Bethlehem hot-rolled sheets measure up to these requirements in every particular.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

104, No. 16, April 17, 1939, issue of STEEL, published every Monday at Cleveland, O. Entered as second-class matter at the postoffice, Cleveland, O., under act of March 3, 1879. U. S. and Canada: 1 year, $4; 2 years, $6; foreign countries, 1 year, $10; Current issues, 25c.

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One of the most important jobs in modern strip mills is positive protection for roll neck bearings.

The Gargoyle D.T.E. Oils specified for this job have a tremendously strong oil film...resist sludging...separate quickly from water and other impurities.

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The right lubricant for every machine . . . and new lubricants ahead of new needs . . . developed by world-famous research laboratories through close cooperation with machine builders.

73 years' experience—thousands of case histories—to guide in prescribing the right use of these lubricants to gain Lubrication Profits for you.

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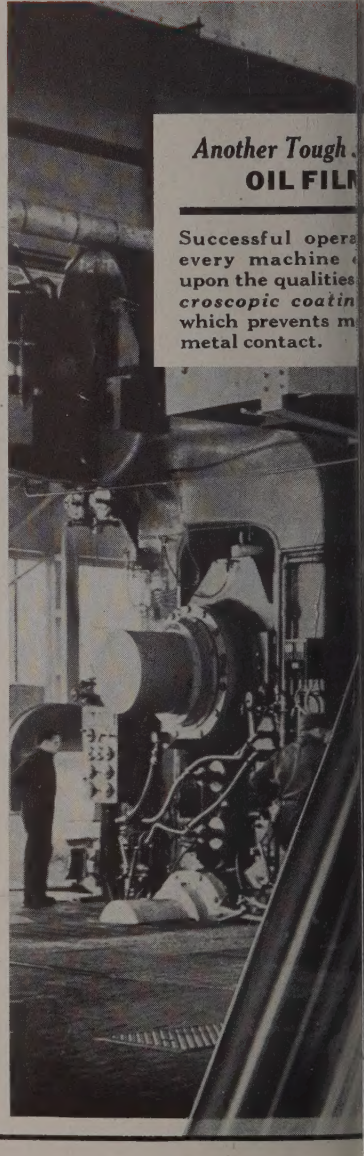
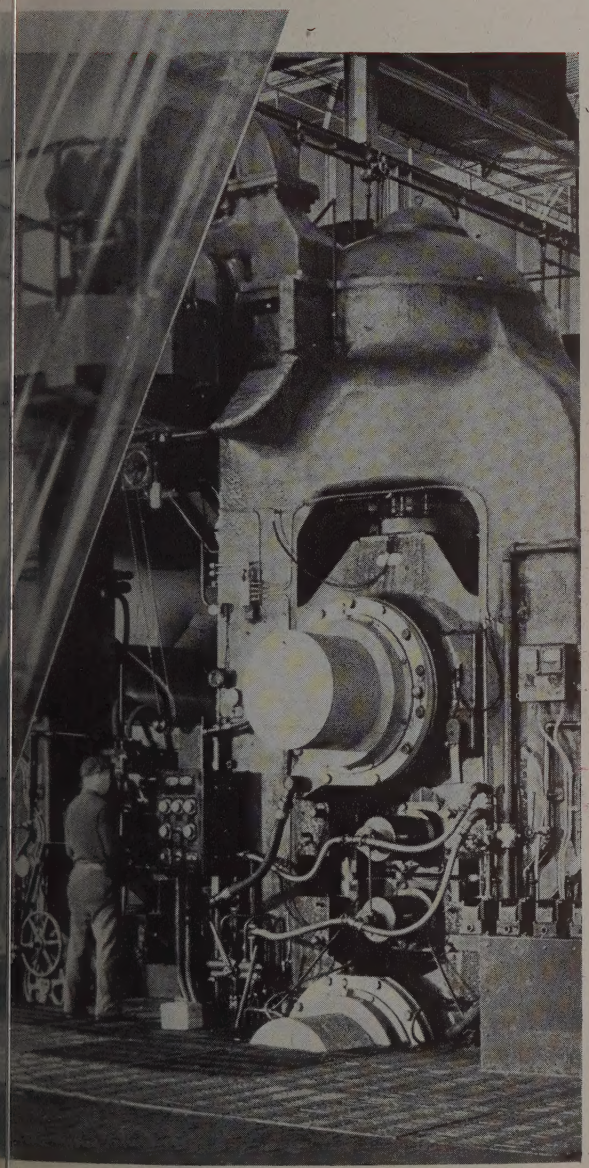


O A NO.1 JOB:

D.T.E. Oil!



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There is probably no other industry in which overhead cranes take so much hard usage as around steel mills. To maintain uninterrupted service requires the liberal construction and high factor of safety found in P&H Mill-Type Cranes. P&H's 50-year experience in building cranes to the specific requirements of the steel industry is a valuable asset to every user. The Harnischfeger Corporation, 4411 W. National Ave., Milwaukee, Wis.

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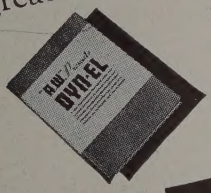
ELECTRIC CRANES ★ EXCAVATORS ★ ARC WELDERS P&H HOISTS ★ WELDING ELECTRODES ★ MOTORS

New Bus Cuts Dead Weight 1300 pounds

25-passenger bus built by BOYERTOWN AUTO BODY WORKS, Boyertown, Pa. Over-all length, bumper to bumper, approximately 25'; over-all width, 96". All structural sections are 18 gage Dyn-el.

With rolled structural sections of conventional steel, this 25-passenger bus would have a curb weight of 10,000 pounds. With formed structural sections of "A. W." Dyn-el, the curb weight is only 8,700 pounds—a saving of 1,300 pounds in dead weight . . . And with all its lightness this body of "A. W." Dyn-el high strength steel is stronger than a conventional body, and has greater resistance to shock, fatigue and corrosion.



The 48-page book, "A. W." Presents Dyn-el, gives full details of savings in weight and cost possible with this new high-strength, flat-rolled steel. Diagrams, tables and charts cover a wide range of tests and properties. To executives, this book gives a quick picture of performance and costs. To engineers, it gives complete fabricating and design properties and table of sizes and weights. We will be pleased to send you a copy.

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ALAN WOOD STEEL COMPANY

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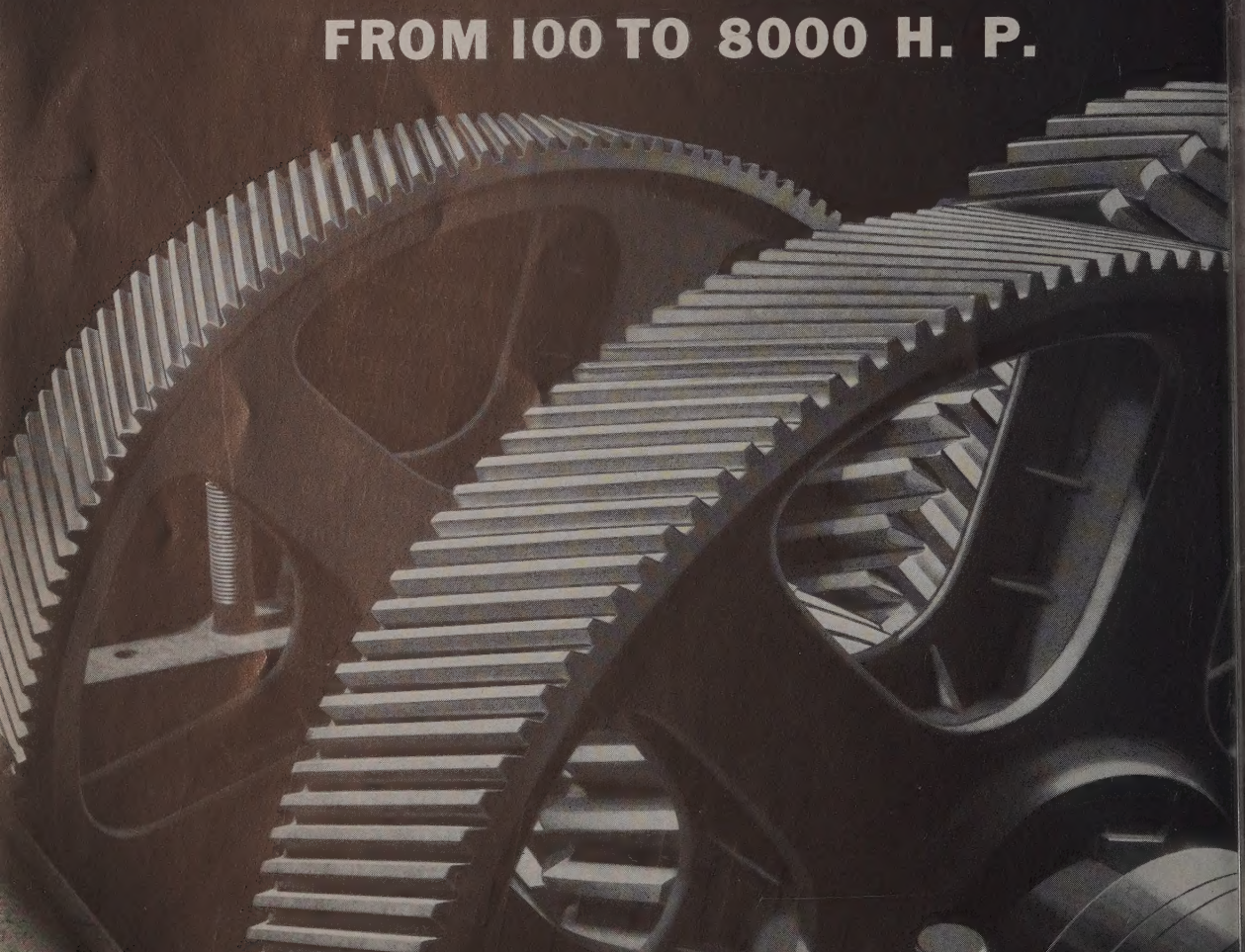

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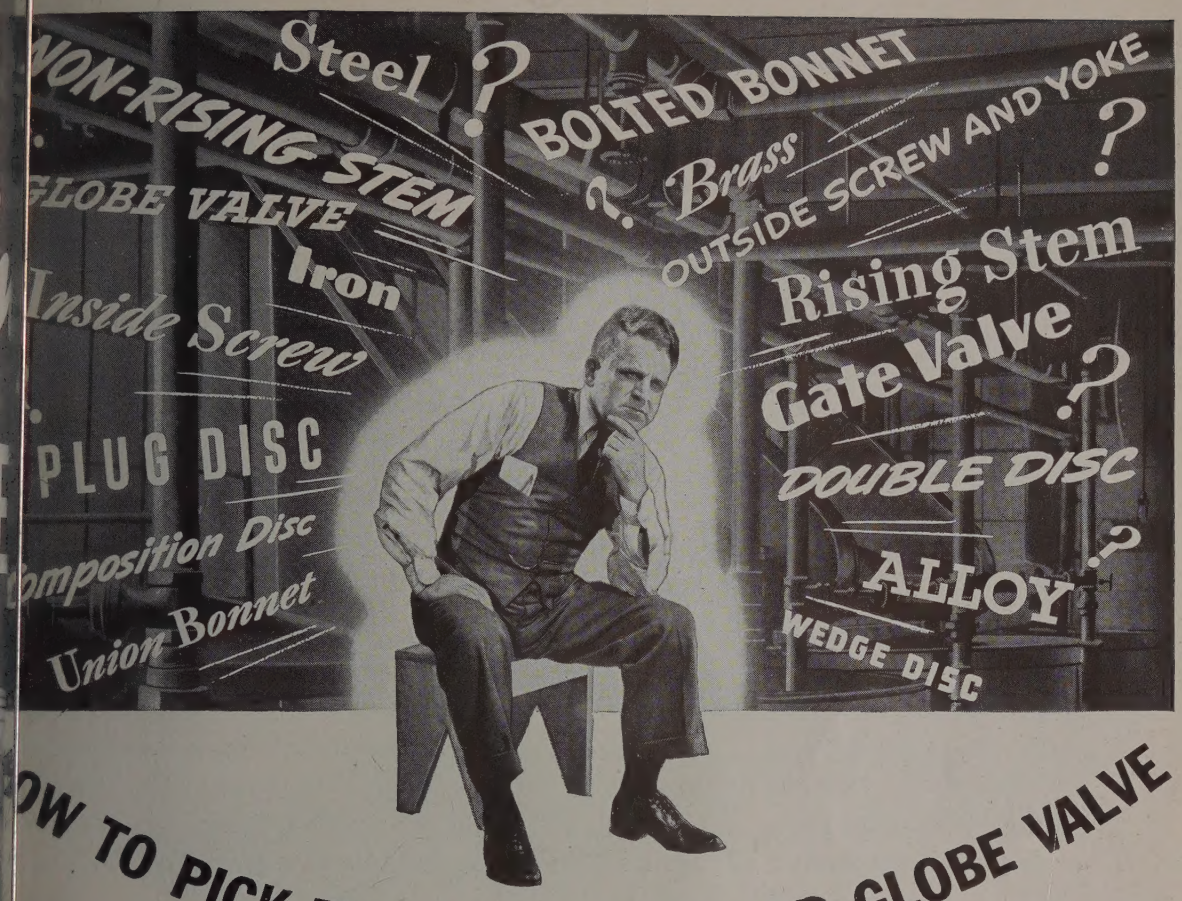

OW TO PICK THE RIGHT GATE OR GLOBE VALVE

FOR A SPECIFIC SERVICE

HERE is no such thing as any one valve to meet *every* service. The feature, for instance, that makes ll type disc valve ideal for hot oil s, makes it unsuitable for throt- g. And when a valve leaks, it sn't necessarily mean that only the is at fault—that valve may be the ng type for the service on which used.

almost any service there is one e that will perform better than any r. That is why the Crane Catalog thousands of valves—to assure getting the one that exactly fits requirements.

The problem, then, is how to pick the right one. As a matter of fact you, who know the actual conditions of your service, are in a better position than anyone else to select the valve you should use.

Get This Valuable Guide Free

To assist you in making this selection we have prepared a bulletin, "Service Characteristics of Globe Valves and Gate Valves," containing a useful chart designed to help you work out your requirements. It greatly simplifies your selection by showing the service characteristics of each type of valve. A copy of this valuable bulletin will be sent to anyone interested—mail the coupon below.

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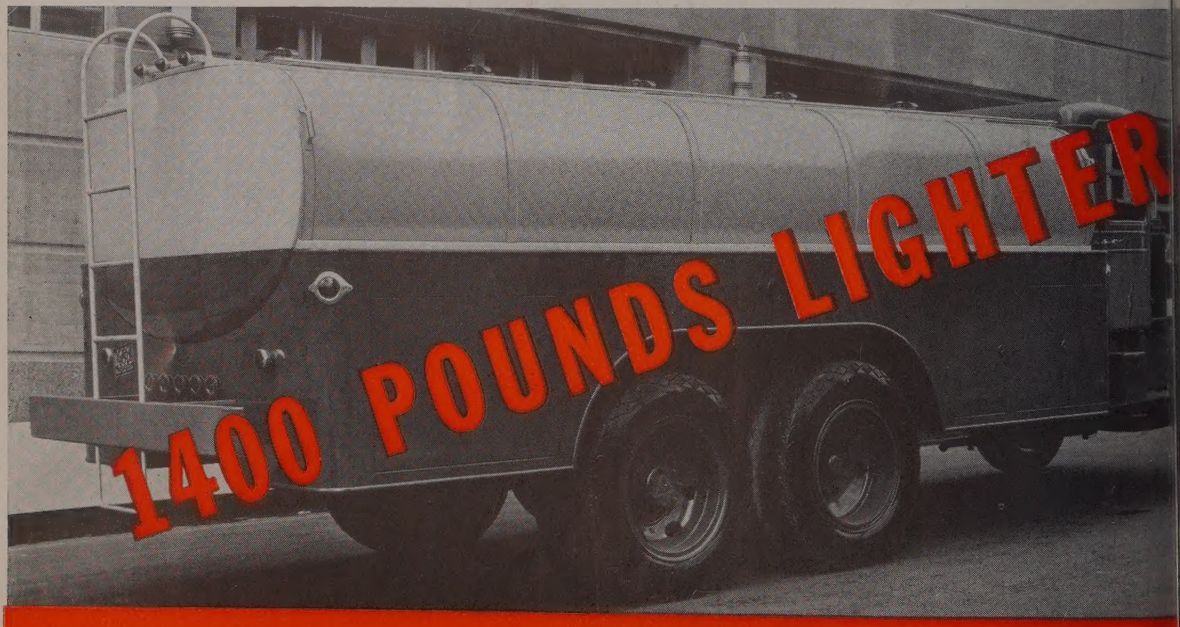

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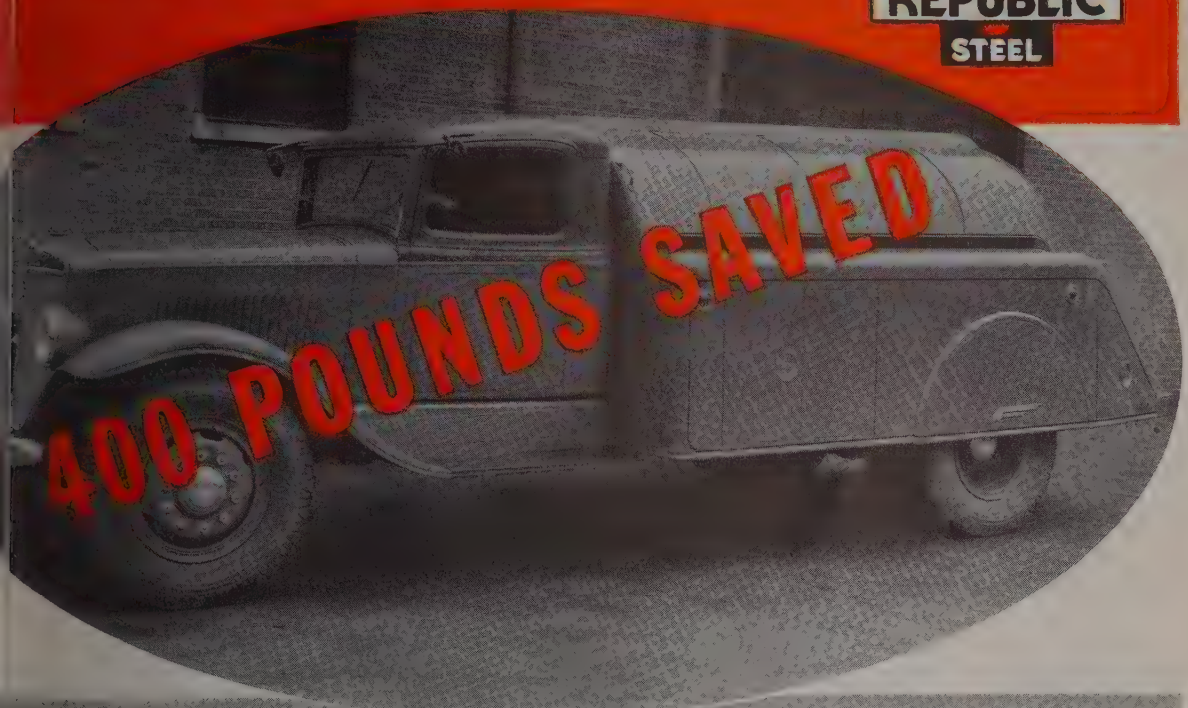

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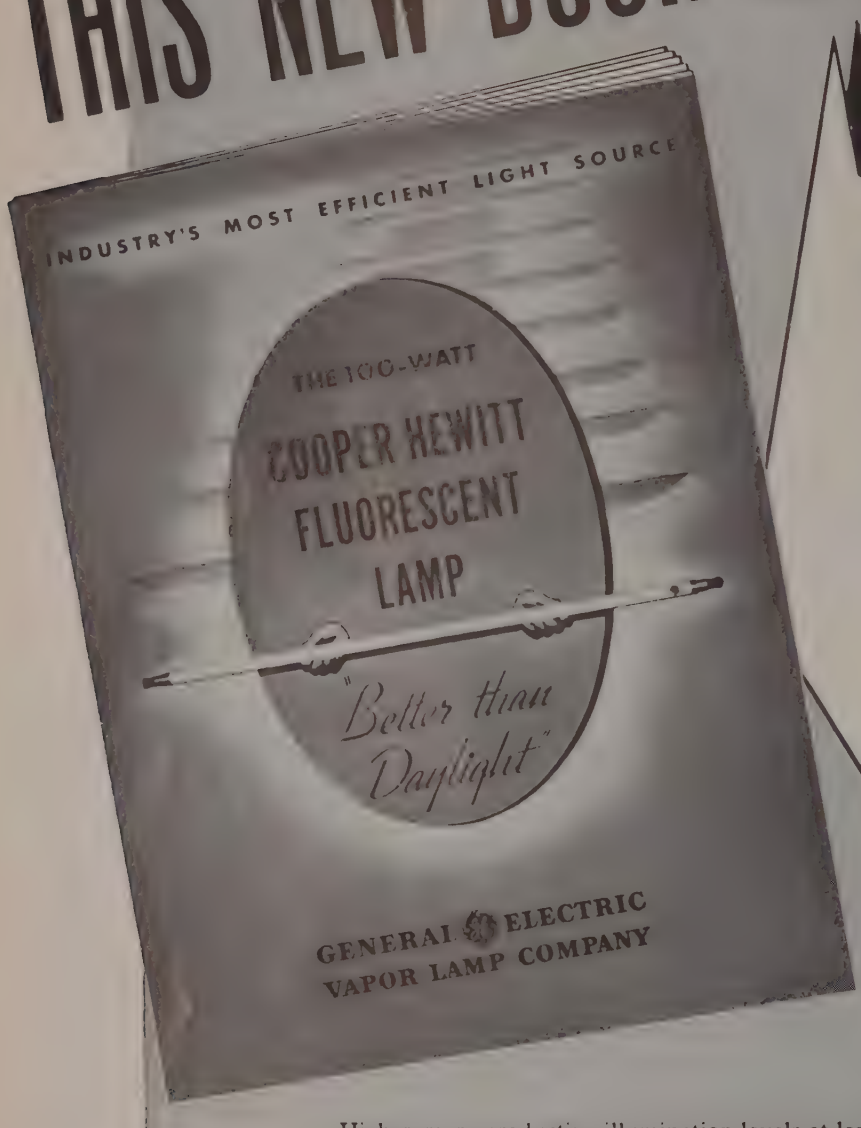

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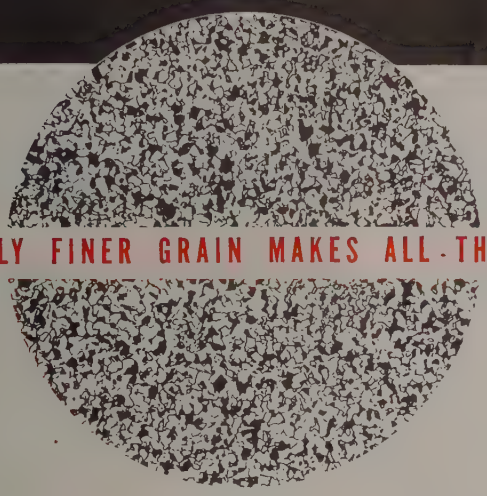
BETTER . . . BECAUSE IT HAS GREATER

Ductility



ITS INHERENTLY FINER GRAIN MAKES ALL-THE DIFFERENCE

One outstanding characteristic of National Steel high tensile is its *unusual* DUCTILITY—a ductility which permits it cold formed into difficult stamped or pressed parts without mediate annealing—and in the majority of cases without change in shop practice.

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addition to its unusual ductility, this high tensile has many other important advantages—advantages have been proved in actual use. It has a high yield point and a high ultimate strength; it is practically non-aging; it has excellent resistance to fatigue and impact at both normal and extremely low temperatures; it welds readily and does not air harden; and it has important corrosion- and abrasion-resistant properties.

This high tensile and HIGH-DUCTILE steel is available in sheets, strip, plates, bars and shapes.

If you have an engineering or production problem, our metallurgical department may be able to show you how this high tensile HIGH-DUCTILE steel can help you find the answer. Inquiries are invited.

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OF

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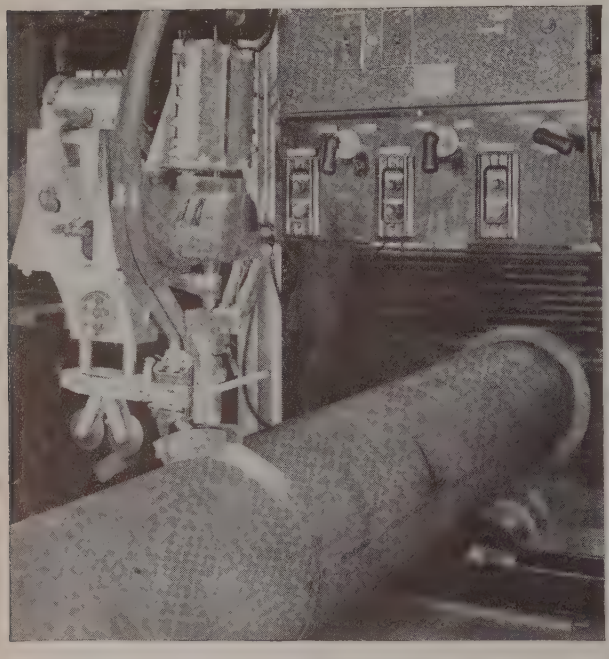
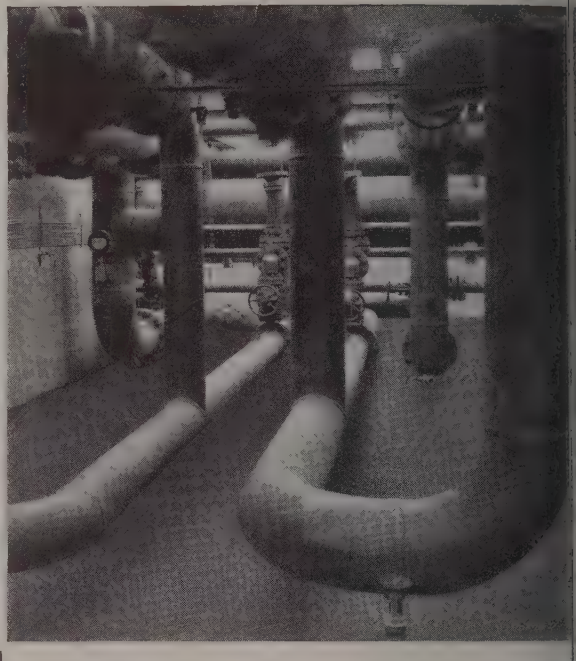
More Power to You

New Linde processes for fabricating pressure vessels and for joining pipe assure long, dependable service

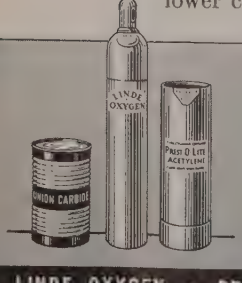




UNIONMELT WELDING: A speedy, dependable, automatic welding process is now available in Unionmelt Welding — an electric welding process—which is shown here making a girth weld on a Par. U-68 (Class 1) type pressure vessel. This vessel has a wall thickness of 5/16 inch, and the weld was made in one pass at 19 inches a minute. Unionmelt welds have met the rigid specifications of the A.S.M.E. code for fired power boilers and of Par. U-68 (Class 1) for high-test type pressure vessels, and have been accepted by various insurance and inspection organizations.

LINDEWELD MULTI-FLAME PROCESS: Strong and tough welds of uniformly high quality can be obtained when piping systems are joined by the Lindeweld Multi-Flame Process which employs the new Oxweld 6- and 4-flame welding tips and high-speed welding rod. These welds, properly made, are permanently leak-proof and require no further attention. Also, they are ductile and are as corrosion-resistant as the pipe base metal. The Lindeweld Multi-Flame Process is fast and consumes a minimum of oxygen and acetylene in the installation of piping systems.

The new processes shown here are being economically applied to the individual needs of many industries. Possibly these or other important Linde developments can help you improve your products, speed production and lower costs. Any Linde representative will gladly discuss them with you.



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The words "Linde," "Prest-O-Lite," "Oxweld," "Lindeweld," "Union" and "Unionmelt" are trade-marks of Units of Union Carbide and Carbon Corporation.

THE FINEST LUBRICANT IS USELESS WHEN WASTED – KEEP IT WHERE IT BELONGS WITH "PERFECT" OIL SEALS

The best lubricant you can buy won't help bearings—unless it is kept in the bearings. When it drips or works out, it causes waste of money—costly bearing trouble.

Chicago Rawhide "Perfect" Oil Seals keep lubricant *in* the bearing where it will do the work—keep grit and moisture *out*.

Not expensive—"Perfect" Oil Seals are easy to handle and install. They need no servicing. They save many times their cost in lubricant and in bearing maintenance and replacement, each year.

Chicago Rawhide engineers will be glad to make suggestions for protecting your bearings.

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READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

...g Jobs for Plus 40's

... Editor:

...nd your readers may be in... in a new organization, ... Plus of Northern Ohio," ...aim is to re-establish in in... executives over 40 years old ...ve been displaced by busi... ...nditions. It is a co-operative ...eeking to show employers ...is advantageous to eliminate ...ry age deadlines discriminat... ...inst men over 40; to demon... ...hat this type of man, with a ...ple business achievement ... is a valuable and economic ... any organization.

...bership is composed of execu... ...hose records of business abil... ...d experience demonstrate ...ly that they are capable of ... responsible positions which ... suitable compensation. No ...rship dues or placement ...s are required. Each appli... ...ubmits a complete business ... before action can be taken ... application.

... the organization constitutes ... of available executives, now ...oyed, with full information ...perience and ability of each. ...eting committee makes con... ...th the employer and recom... such club members as would ... specifications of the job. No ...r needs to try to sell himself. ...lling is done on a business ...y the committee. When placed ...osition a member's connec... ...th the club is severed.

...nemployed executive unable ...e himself soon loses morale ... is surprising how quickly he ... it when associated with this ...zation, contact with others in like position, and a chance to get another job stiffening his backbone anew.

Ohio unemployment commission has welcomed this opportunity to co-operate with unemployed executives, as it offers opportunity to find men suited to fill applications for which no source had existed.

In the few weeks since our organization we have placed nearly a dozen executives who had been unemployed for varying periods since the depth of the depression separated them from their jobs, with profit to them and to the employers who had sought their services.

Headquarters are at 897 Union Commerce building, Cleveland. We welcome applications from any persons qualified and from employers in need of high class services. As the club's existence and aims become better known we believe both classes will be benefitted by the co-operative effort we are putting forth.

L. C. HOFFMAN

Cleveland Heights, O.

Serious Problem, Well Handled

To the Editor:

Let me congratulate you on the article on leveling employment in the steel industry. (STEEL, April 10, p. 15.) It is a splendid presentation of a serious problem and the suggestion you have made for relieving it to some extent should result in a general discussion between steel producers and consumers.

You have done so well with the suggestion that I have nothing further to offer.

STEEL BUYER

New York

Is Passing it Along

To the Editor:

I have found your article on "Pride in Craftmanship" (STEEL, March 27, p. 40) very interesting. I am passing it around to several in our organization whom I know would like to read it.

CLAYTON R. BURT

President and General Manager,
Pratt & Whitney,
Hartford, Conn.

Fosters Spirit of Pride

To the Editor:

We were pleased with the way you handled the article, "Pride in Craftmanship" (STEEL, March 27, p. 40) and we realize you must have recognized the existence of the spirit throughout our society.

We know there is a spirit which exists among men in this work and we believe it is the most valuable thing we have and we continue to foster it as a society. We believe it is responsible for much of the success of our various undertakings.

FORD R. LAMB

Executive Secretary,
American Society of Tool Engineers,
Detroit

Has Leveled Its Employment

To the Editor:

While every phase of the steel industry has its own problems we and several other companies are and have been for years doing what you suggest in your article on leveling employment. (STEEL, April 10, p. 15.) Some producers cannot do this and we cannot in the case of many products.

STEELMAKER

Pittsburgh

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Are ALL New Mode

Tin Mills Equipped by

KEMP

There are many reasons why modern tin stacks the world over install Kemp Immersion Melting (with gas).

Here are the main ones:

1. Increased production is given where tin pots are Kemp equipped. No crew and no machine can out-step hot metal.

2. Improved quality may be expected through tin and palm oil temperature regulation, giving the closest control ever secured.

3. Detailed production records credit with 40% saving in fuel. Heat is a inside the metal not outside the pot.

4. Kemp gives material dross redu which will pay phenomenal retur required investment.

For further details address The **C. M. K Manufacturing Co., Baltimore, or Oliver Building, Pittsburgh,**

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STEEL

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FEWER REJECTIONS.. LOWER COSTS.. INCREASED PROFITS

..WITH THE HELP OF ALLOY NICKEL STEELS

MODERNISM brings new customers and new profits to roads. Typical is the "Broadway Limited," leader o Pennsylvania's fleet of nine new streamliners. From car frames of Nickel alloy cast steel to Nickel-copper-molybd steel roofs, Nickel saves weight, lengthens service life pushes down cost per mile and cost per year.

WHETHER you're hauling extra fare passenger doing precision machining—Nickel can make ounce, each inch of metal do more work at l cost per year.

Nickel, alloyed into steels, irons or non-fer metals, provides improved mechanical proper The heightened abilities of Nickel alloyed mat cut rejects during production, lower machining and increase profits by lengthening service life. specific information about money-saving app tions of Nickel in your industry, please address inquiry to the address below.

REJECTIONS CUT 75%—"Since using Nickel steel (4615) rejects due to warpage in heat treatment have dro 75%," says Jacobs Mfg., Co., Hartford. "This Nickel-m denum steel provides required hardness and toughness in chuck jaws, plus added core strength to prevent bendi breaking. Nickel alloyed chucks *stay* accurate—assure accu boring and machining."

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK,

the Editor
ws the News

THREATS in Europe and uncertainty as to nt to which the United States would be af- ontinue to influence business sentiment ad- The recent recession in business volume has a little more momentum. Steel production k (p. 27) receded two points to 51½ per cent capacity. Scrap prices (p. 92) have weak- ther as a result of the less favorable out- steelmaking. Although motorcar assemblies increased about 1000 units last week, parts on has tapered and little additional steel buy- n sight (p. 87) over the remainder of the del year. . . . On the other hand, our na- ilitary preparedness program (p. 23) is mov- he stage where huge additional orders soon eleased to industry.

• • •

state to outlaw certain tactics of organized Wisconsin which (p. 41) limits the term isputes" to actual disagreements between em- ployers and employes resulting in a strike or lockout, and which pro- hibits "stranger picketing." At Washington (p. 32), examination with a view to amending the act is under way. . . . How extensively is y fortified with reserves of that vital mineral, ? STEEL's survey (p. 26) reveals she has no rge or rich deposits and is dependent at least cent on foreign supplies. . . . Early indica- 27) point to the probability that most of the el companies will report a small net profit on arter operations.

• • •

thority on safety estimates (p. 35) that the States Steel Corp. has profited by more than),000 on its investment of $26,000,000 in safe- ty since 1912. . . . Displeased with the one-sided story which the fed- eral trade commission recently told about the steel industry, the tem- porary national economic com- has decided (p. 34) to let industry hereafter own story about the nation's economic prob- lems. . . . The Wheeler-Truman bill (p. 34) would prohibit a carrier from transporting commodities owned by its parent company; such prohibition would affect industrially owned railroads, pipelines and water carriers. . . . The bureau of public contracts (p. 34) amends its definition of a "dealer" and de- fines a "machine tool dealer."

• • •

A new process permits economical production of dies for die castings and molds for plastics. Dies are electroformed as shells which (p. 46) then are backed with bronze, brass or iron. . . .

Narrow Field?

A southern metallurgist (p. 48) answers the question: "Why does iron made from brown ore give better results in the gray iron foundry than iron made from red ore?" . . . A well- known metallurgist (p. 84) deplores the flood of new varieties of tool steels and cutting materials; he urges co-operative action by producers to narrow the field to a few types of materials so as to avoid confusion among consumers. . . . Oil well bits are required to give unfailing service under severe conditions of abrasion and strain. Certain new alloys (p. 76) give good results in this use.

• • •

Last year's joint open-hearth and blast furnace conference was unusual in that it was attended by representatives of practically the entire iron and steel industry in this country. An ex- tensive program has been arranged (p. 50) for this year's conference, to be held in Cleveland, April 26-28. Five sessions will be held by the open-hearth and three by the blast furnace group. . . . For the forty-third annual meeting of the Amer- ican Foundrymen's association an elaborate program has been arranged (p. 78); the meeting is to be held in Cincinnati, May 16-18. . . . Three groups of steels, one relatively new, now are in general use in the manu- facture (p. 70) of automotive engine exhaust valves. . . . Using thoroughgoing organizing methods (p. 66) an electrical equipment manufacturer has created an extremely successful weldery.

Steelmen To Confer

E C Kreutzberg

"That Mark Steers You Clear of Trouble"

"Sure, I've seen all kinds of sheets go through the works," says a veteran of more than 20 years in a big automobile body plant.

"Yes, they're all made of steel. So are all cigars made of tobacco, but you don't get the same satisfaction from all cigars. Sheets can vary, too.

"I'll take Inland Sheets because that diamond trade-mark steers you clear of a lot of trouble, and the men from Inland are on the job every day watching quality and service."

INLAND STEEL CO

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. P

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCIN

Preparing Nation's Armed Forces for Emergency; Steps Affecting Industry

WASHINGTON

ESPITE the economy wave h has swept over congress in re- months, the army and navy been dealt with generously in opriations for preparedness.

the beginning of the present on President Roosevelt asked $552,000,000 for emergency de- e purposes. Appropriations made ar this year for both arms of national defense have exceeded e of any other peace-time pe- in the nation's history.

congress' plans come to fruition United States army will be one he best equipped in the world, ed strongly by industries on h it depends for supplies.

esent program will provide this try with 9000 military air- es, 6000 for the army and 3000 the navy, by the close of fiscal 1941. The recently passed ,000,000 defense measure au- izes the army to spend $170,- 000 in expanding its air power.

same act makes provision strengthening Panama canal de- ses, furthering the program to n student fliers, and increasing ustrial educational orders.

deficiency bill appropriating ,000,000 also has become law, ng the army $116,000,000 for equipment and seacoast defenses. Most of this money will be used to purchase semiautomatic rifles, light and heavy artillery, tanks, antiaircraft guns and the like. Another bill appropriates $17,000,000 for air defense construction in the Panama canal zone.

The army air corps' authorized strength approximated 2400 planes of various types, until the recent measure increased this number to 6000. The bill specifically calls for 3532 planes in addition to those already on hand or on order. This will raise the total by 1941 to approximately 6000, of which number it is contemplated that about 2500 will be held in reserve, without personnel. More than 1300 of the reserve planes will be of the combat type. The war department is devising means to assure increased balanced productivity by private aircraft plants. War department officials are consulting with aircraft manufacturers to reach a sound solution to this problem.

Another matter highly important to the army is that of educational orders. President Roosevelt last week wrote to Speaker Bankhead, urging early appropriation of the $32,500,000 authorized for such orders by the emergency defense bill. This with the $2,000,000 appropriated last year would make available $34,500,000. Army officials are forging ahead with preparations for the orders.

When only $2,000,000 appeared available this year the war department announced it had selected certain items for educational manufac-

■ **Vital in warfare are ground defenses against air attack. Many more antiaircraft guns of this type are said to be needed by the army. U. S. Army Signal Corps photo**

■ Symbolizing America's growing strength in the air, these latest army attack planes were built by Douglas Aircraft. Under present program, army and navy fighting airplanes will total 9000 at the close of fiscal year 1941

ture, including "semiautomatic rifle; recoil mechanism, 3-inch antiaircraft gun; forging, 75 mm shell; machining, 75 mm shell; gas mask; and 60-inch searchlight." There is no doubt that later this year others will be added to the list.

Louis Johnson, assistant secretary of war, has directed that the articles be essentials, should be standard for procurement in war, with the probability of remaining standard for a considerable time. They must also be noncommercial in character, and required in such large quantities, or be of such intricate nature, that education of the industries in their production is necessary.

Bills relating to strategic minerals are pending in both houses. As originally provided in one measure, $25,000,000 per year was to have been spent for a four-year period to acquire stocks, with $2,000,000 over the four-year period for investigations by the bureau of mines.

Bill already passed by the senate reduces the $25,000,000 to $10,000,000 per year for a four-year period. A like expenditure is contemplated by the house in a pending measure. These bills provide for purchasing and storing raw materials such as manganese, aluminum, and other items not produced in the United States in quantities sufficient for war purposes.

Pending defense legislation would increase the regular army to 220,000 officers and men, compared with 180,000 today; national guard would comprise 210,000. It is estimated by army officials it would cost $420,000,000 to arm and equip this initial protective force. Experts say the sum would equip 15 regular and national guard antiaircraft regiments, and 34 infantry regiments. It would furnish gas masks at $9.25 each; medium tanks at $46,000 each; 37 mm antiaircraft guns at $20.000 each; semiautomatic rifles at $80 or less; and other needed equipment.

Improve Coastal Defenses

Panama, Hawaii, and the United States will have their coastal defenses strengthened under an appropriation of some $6,500,000. Bill provides for additional antiaircraft guns, railway guns and fixed fortifications. Congress also has authorized the garrison at the Canal Zone be increased by 6400 men and 180 officers, bringing the total to 21,000. New housing is to be provided, which together with p the additional personnel, subs and transportation will cost $24,000,000.

Included in emergency d plans is provision that the se of war enroll at the air co dent training center selected bers of the instructional st civilian flying schools. This able the war department t instructors at civilian scho which army men are detai training, in close touch wi curricula and methods of corps center, and will serve ordinate the instruction a classes of schools. The wa tary also may lend aircra other aeronautical equipm these civil schools for inst and training of army person

Air Specialists Needed

Under its expansion progra air corps will require add pilots, mechanics, and other s ists. The army's present t facilities being insufficient, be necessary to utilize cert credited civilian aviation sch

The navy is not lagging in ing its fighting force up to although its appropriation bi not yet been reported by the appropriations committee. Ob ly, a navy cannot be built ove It takes five years to construct tleship, and another year to personnel into shape for opera

A navy is unlike a land fo the matter of training. A fou enlistment is said to scarcely a sailor on his career. Arm pansion will prove a quicker

America is now building six ships of 35,000 tons. Recent navy department asked congr funds for two 45,000-ton battle largest in the world. Pre Roosevelt endorsed these ship ing Admiral William D. L chief of naval operations, aut for their construction. It was at that time certain other n intended to build 45,000-ton c ships, and under the 1938 co tion act the President has disc ary power to meet such tonn

Navy department officials w peared before a house subcom on appropriations during hea on the $750,000,000 naval budg timates, proposed these two ships be included in next building program. The ships cost from $80,000,000 to $100,0 each.

President Roosevelt has congress for an additional $1 000 navy appropriation. He pro that $16,000,000 of the budget mates for ship construction be for new equipment and facilit navy yards and stations. Total posed for the navy next year stands at about $750,000,000.

Included in the supplem

000 is $14,000,000 for con-
n and procurement of air-
4,000,000 for ordnance; $300,-
tools and machinery at the
, Va., training station; $225,-
improving the New London
ine base; and $354,000 for
al reserve.

's 1938-1939 ship construction
n provides: four battleships,
tons each; six submarines,
ons; and eight destroyers,
ns. Also included are one
er tender; one submarine
two seaplane tenders; two
veepers; three fleet tugs; and
ers. Other ships on the pro-
or which bids have not yet
eceived include an aircraft
four cruisers; one mine lay-
one oiler. Total cost of this
r building program is not
le, but the ships cost from
000 for the battleships down
t $1,000,000 for the tugs.

complete construction pro-
s of Feb. 1 involves six battle-
one aircraft carrier; one
cruiser; two light cruisers;
marines; 39 destroyers; two
er tenders; two mine sweep-
ne submarine tender; three
ugs; and four seaplane tend-

"Best Navy" Urged

econd best navy is like a sec-
st poker hand," says Charles
, assistant navy secretary. "It
ome importance during the
g operations, but when a
own comes there is only one
g hand."

Edison contends that if we
a navy at all, "we need one
an defeat any probable enemy

■ This high-speed army tank is entirely off the ground after taking a hurdle. U. S. Army Signal Corps photo

or probable combination of enemies."

Due to the increasing world unrest, the President and congress in 1933, after a decade of practically no naval construction, authorized 32 new vessels. This exceeded the total authorized between 1922 and 1932. During that decade, ship design and building became almost a lost art in the United States, falling far behind industry in the far reaching and rapid advances that had been made in engineering.

In 1934, the President again recommended to congress that the fleet be built up to the tonnage allowed under the naval treaty. Congress accordingly passed the so-called Vinson-Trammell act, providing for 141 additional ships of various categories. The naval treaty having expired, President Roosevelt asked congress to exceed the treaty limits by 20 per cent. Under legislation passed last year, 46 additional fighting vessels and 22 auxiliaries were authorized.

Through the present naval building program, industry is gaining practice in activities essential to preparedness. Co-operation and co-ordination with the army in the matter of industrial preparedness is the subject of continued study by the army and navy munitions board.

ightiest units in Uncle Sam's fleet, battleships are armored with steel plate, h at some areas is 18 inches thick. Now building are six 35,000-ton craft, with two more of 45,000 tons being considered by congress

Speeds Construction Program

Task of co-ordinating the navy's shipbuilding program has been delegated to Assistant Secretary Edison. Such co-ordination has comprised reducing as far as possible changes during construction; rushing a program for expanding and modernizing navy yard facilities with new machine tools; canvassing the commercial field for every possible aid in completing the building program; increasing supply sources; acquiring stock piles of strategic and critical materials; improving contract terms; and continuing fair standards of labor management.

It is to be borne in mind the government's fiscal year ends June 30. During the year ended June 30, 1938, construction for replacing over-age vessels and aircraft aimed to bring our naval strength up to that authorized by the Vinson-Trammell act of 1934. Work was started on two battleships provided in the 1937 naval appropriation act, and on eight destroyers and four submarines provided by the 1938 act. The naval appropriation act for 1939 car-

ries funds to commence replacements for two battleships, two cruisers, eight destroyers, and six submarines. In addition, the deficiency act of June 25, 1938, provided for replacing two more battleships.

Experts declare the sorry condition of the navy's auxiliary ships is only slightly improved. No relief is seen until authorized fighting ship replacements are completed. Nearly all the auxiliaries in commission are slow and over-age, and replacements for them would not be immediately available in the merchant marine in time of war due to the special construction and facilities they require.

Naval aviation has continued its rapid strides in developing aircraft of improved performance. The fleet constantly demands broader and more inclusive roles for aircraft in its tactical organization. The importance of meeting these needs has resulted in assigning greater precedence to aircraft development than to the correlated requirements of supporting tenders and shore stations. Construction of the latter is lagging behind aircraft deliveries. With the naval expansion program in immediate prospect, active measures to increase the number of aircraft tenders and to develop adequate shore facilities are considered essential.

At the beginning of the present fiscal year, the navy had on 1390 service and 115 obsolet craft, with 642 units on order. represented a total gain of 20 the preceding year. Since the plane limit provided in the naval expansion act has n been attained, an additional in is anticipated this year.

Navy officers ascertained t fect of bombs exploded on o a modern battleship. As res these tests they insist aviatio not supplanted any existing t ships, but complements them increases their efficiency. maintain naval aviation adapts tion to naval use, and its de ment must be by the navy.

■ "Steel Over All." Theme cut used extensively in Germany

Spain's Iron Ore Resources Substantial, But Far Below Fascists' Requirements

■ GENERAL FRANCO'S victory in Spain is expected to give his fascist allies, Germany and Italy, access to Spain's substantial mineral resources. Among the most important to the Rome-Berlin axis are the rich iron ore deposits. Also of considerable import are the copper, mercury and lead resources.

Spain's iron ore deposits, especially those in the northern section near Bilbao, long have been famous. They average between 40 and 60 per cent iron. They have been exploited for many years. Since Spain, lacking coal, does little local smelting, most of the ore output has been exported, giving it significance to countries which have insufficient native reserves.

Approximately half Spain's total ore output comes from the Viscaya (northern) district. Santander, Teruel and Almeria contribute about 12 per cent each and 14 other provinces have small reserves. Ores are hematite, siderite, brown and carbonates.

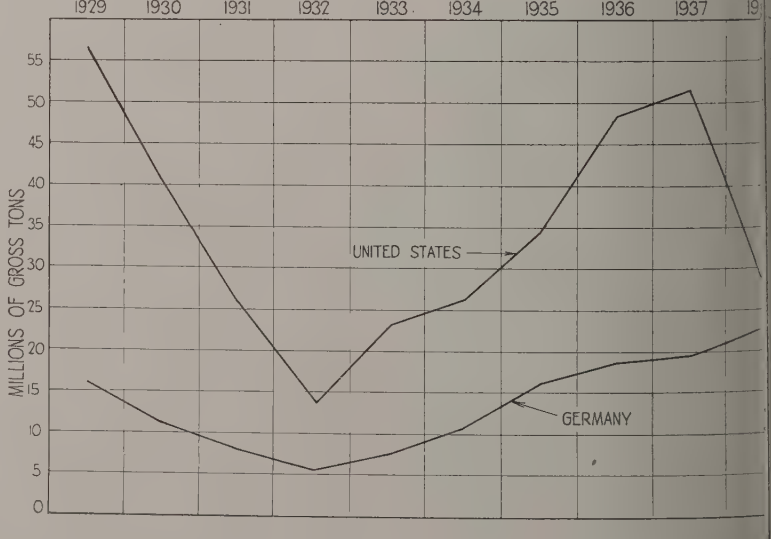
In the past the bulk of Spanish exports went to Great Britain whose capital developed the deposits. Germany and the Netherlands also have been good customers.

Despite their fame, however, the Spanish deposits do not bulk large in the world's production or reserves. They represent less than 2 per cent of the known merchantable reserves, and before production was disrupted by the Spanish civil war, output was only 3 to 4 per cent of the world's total.

Before the Spanish civil war, production fluctuated between 3,000,000 and 5,000,000 metric tons annually. In 1913, Spain's output totaled 10,788,000 tons; in 1928, 5,790,900 tons; in 1932, 3,130,700 tons; in 1933, 3,387,400 tons. Pig iron production in 1932 was only 296,000 metric tons, and in 1933, 334,000 tons. During the civil war, ore, pig iron and steel production dropped sharply.

Ore production, with German or Italian help, can be stepped up from the 3,000,000-ton level o early 30's. It is improbable, ever, that the Spanish surplus, if all were shipped to Gern could be sufficient to meet reich's need for imported ore. many must continue to loo Sweden or other sources for a siderable quantity.

Although the Nazis have int fied efforts to make Germany sufficient in these resources building blast furnace plants work native low-grade ores, perts in Germany agree the ou of the reich's deposits prob never will be sufficient to su



■ Sharp fluctuations have characterized United States' production of steel ing and castings since 1929; Germany's have been less pronounced. In each of ten years, United States has been the world's largest producer; Germany rated second in each year except 1932, when her output was exceeded by Rus

STE

and steel industry's require-

as been estimated that Ger-
on ore deposits are capable
g exploited to provide for
0 per cent of requirements,
at this percentage could be
d only by complete disre-
or economy in mining and
g.

e first nine months of 1938,
ny imported 16,761,833 metric
iron ore, compared with 14,-
tons in the same period of
This was in addition to in-
production of low-grade
ores, and a sharp increase
rian ore output.
all of 1938, domestic iron ore
tion was 11,000,000 tons, a 25
t increase over 1937.
ite the reich's ore scarcity, its
n and ferroalloy production
ar was 18,200,000 gross tons,
only to the United States,
produced 19,240,000 tons. The
output of steel ingots and
s also was second largest in

SH STEEL OUTPUT ALL-TIME RECORD

don — (*By Cable*) — British orks are operating practically acity. Production of steel in- nd castings in March totaled 00 gross tons, 199,800 tons han in February. The March was only 7400 tons less than -time high of 1,178,300 tons, in ber, 1937. Pig iron produced ted to 603,600 tons, a gain of tons over February.
lworks are busy, mainly due mament programs. Special and tools are in demand.

orld at 22,900,000 gross tons, red with United States' 28,- 1 tons. Germany's high iron eel output was made possible reased use of scrap.
man acquisition of Czechoslo- gave the reich an interest in eja Mining Co. in Sweden, for- partly owned by the Vitkoc- ron Works of Moravia. The company produced 376,000 f ore in 1937, latest period for statistics are available. Ger- firms also have recently ac- interests in several other Swedish mines.
vever acquisition of Czecho- ia and Austria is unlikely to ially change Germany's iron tuation.
territory that was Czechoslo- reached a peak production in with less than 2,000,000 tons. than half Czechoslovakia's eeds have been imported from en. Austria in 1938 is claimed

(*Please turn to Page* 84)

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended April 15	Change	Same week 1938	Same week 1937
Pittsburgh ...	45	— 4	30	95
Chicago	53.5	None	30	84
Eastern Pa...	40	None	28	59.5
Youngstown..	43	— 5	31	86
Wheeling	65	— 1	31	96
Cleveland	39.5	—13	23	76.5
Buffalo	44.5	None	28	90
Birmingham..	60	— 2	66	80
New England.	35	None	30	97
Cincinnati. ...	51	+ 7	18	86
St. Louis.....	44.5	+ 2.5	42.4	82
Detroit	59	—10	18	100
Average....	51.5	— 2	32	91.5

PRODUCTION

■ STEELWORKS operations last week declined 2 points to 51.5 per cent. Reductions were made in six districts, advances in two, and four were unchanged. A year ago the rate was 32 per cent; two years ago 91.5 per cent.

Youngstown, O.—Declined 5 points to 43 per cent as five open hearths were taken off, leaving three bessemers and 37 open hearths in production.

Detroit — Dropped 10 points to 59 per cent, lowest since August, 1938. Active open hearths number 14 out of 25.

Birmingham, Ala. — Off 2 points to 60 per cent, one open hearth being taken off, leaving 12 active.

Cleveland — Receded 13 points to 39.5 per cent, all interests reducing output. The rate at the close was 3 points below the average for the week.

St. Louis — Increased 2.5 points to 44.5 per cent on expansion by one producer.

Cincinnati — Advanced 7 points to 51 per cent, with a similar schedule likely this week.

Pittsburgh — Down 4 points to 45 per cent. Indications point to further curtailment this week.

Wheeling — Net result of various changes was a reduction of 1 point to 65 per cent.

Central eastern seaboard — Held at 40 per cent for the sixth week.

New England — Steady at 35 per cent. Some semifinished steel is being drawn from stocks.

Buffalo — Remained at 44.5 per cent. One producer may increase its rate this week.

Chicago — Continued at 53.5 per cent for the third week.

FINANCIAL

REPORT MODERATE PROFITS FOR FIRST QUARTER

■ A SMALL profit for most of the large steel producers is indicated for the first quarter on the basis of 54.14 per cent steelworks operations in that period. In fourth quarter, 1938, when the steelworks rate averaged 55.77 per cent, nine of the leading producers reported an aggregate net income of only $13,466,467. However, prices have shown more stability than in the closing months last year.

Reporting to Republic Steel Corp. stockholders at their annual meeting in Jersey City, N. J., last week, T. M. Girdler, chairman, said the corporation made a little money, "but not much", in the first three months. "I think we would have a pretty good business this year if war rumors stopped," he said.

Inland Steel Co. is expected to show a net profit at least as large and probably larger than the $1,759,785, or $1.11 a share, reported in fourth quarter.

Otis Steel Co. is understood to have operated in the black during January and February and it is believed will show a net profit for the first quarter. In the same period last year it had a net loss of $297,379.

Sloss-Sheffield Steel & Iron Co.'s net income for first quarter amounted to about $226,000, Hugh Morrow, president, reported to stockholders. Outlook for second quarter is not so bright due to a rather sharp decline in shipments on contracts in the latter part of March.

FIRST QUARTER STATEMENTS

Rustless Iron & Steel Corp., Baltimore, net profit $207,777, or 21 cents a common share, against net loss $62,651 in first quarter last year.

Transue & Williams Steel Forging Corp., Alliance, O., net profit $7930, equal to 6 cents a share on 134,150 shares. Net loss $68,219 in same quarter, 1938.

Bridgeport Machine Co., Wichita, Kans., net loss $139,264, after charges but before income taxes, compared with $10,338 loss in first quarter, 1938.

Bliss & Laughlin Inc., Harvey, Ill., net profit $134,381, equal to 75 cents a common share. Net loss in first quarter, 1938, was $26,091.

New York Air Brake Co., New York, net profit $107,803, against net loss of $92,268 in the quarter last year.

Van Norman Machine Tool Co., Springfield, Mass., net profit $58,565,

equal to 66 cents a share on capital stock, compared with $117,335 net profit, $1.32 a share, in the 1938 period.

American Forging & Socket Co., Pontiac, Mich., net profit of $50,873 for its second fiscal quarter ended Feb. 28. Net income for first fiscal quarter ended Nov. 30, 1938, was $21,817.

Eaton Mfg. Co., Cleveland, net profit $725,999, equal to $1.03 a share on 703,646 shares. This compares with net loss of $199,042 in the first quarter last year, and net profit of $612,318, or 84 cents a share, in the fourth quarter, 1938.

Westinghouse Electric & Mfg. Co. reports orders in first quarter totaled $50,120,832, or 32 per cent more than in first quarter last year, and largest for any quarter since the second of 1937.

Twin Coach Co., Kent, O., net profit $55,985, or 12 cents a common share. In first quarter last year company had net profit of $21,389, equal to 5 cents a share.

DIVIDENDS DECLARED

Continental Can Co. Inc., New York, interim dividend of 50 cents a common share, payable May 15 to record April 25. A similar dividend was paid Feb. 15.

American Can Co., New York, $1 on common, payable May 15 to record April 25.

Maytag Co., Newton, Iowa, 75 cents a share on the $3 preferred, and $1.50 on the $6 first preferred stock, payable May 1 to record April 15.

Consumers' Net Income 32 Per Cent of 1937

■ STEEL's tabulation of reports from 184 companies among equipment manufacturers, suppliers and consumers shows an aggregate net income of $107,922,942 in 1938, only 32 per cent of the $335,592,524 net income reported by the identical companies in 1937. Prior tabulations were presented in the following issues: Feb. 13, p. 30; Feb. 27, p. 18; and March 27, p. 17. The subjoined table lists 59. Fifty-five of the 184 companies recorded a loss last year, while only 12 reported a deficit in 1937. All figures are net income, except where asterisk denotes loss:

	1938	1937
Addressograph-Multigraph Corp., Cleveland	$ 906,693	$1,950,802
American Hardware Corp., New Britain, Conn.	78,588	829,669
American Machine & Foundry Co., New York	892,922	1,038,346
Automatic Products Corp., Chicago	53,755*	63,247
Bath Iron Works Corp., Bath, Me.	175,518	20,419
Boeing Airplane Co., Seattle	554,958*	311,683
Borg-Warner Corp., Chicago	19,966*	8,348,089
Canada Wire & Cable Co., Toronto, Ont.	462,655	794,252
Central Foundry Co., New York	415,999*	43,360
Centrifugal Pipe Corp., Jersey City, N. J.	503,902	606,375
Columbus Auto Parts Co., Columbus, O.	70,941	285,908
Consolidated Aircraft Corp., San Diego, Calif.	1,535,110	462,959
Container Corp. of America, Chicago	29,470	1,784,105
Curtiss-Wright Corp., New York	3,598,739	1,983,609
Diamond T Motor Car Co., Chicago	1,154	441,307
Driver-Harris Co., Harrison, N. J.	45,972*	390,555
Durham Duplex Razor Co., Jersey City, N. J.	36,694	7,282
Eisler Electric Corp., Union City, N. J.	21,863*	1,559
Emsco Derrick & Equipment Co., Los Angeles	230,029*	546,131
Ex-Cell-O Corp., Detroit	437,677	655,618
Ford Motor Co. of Canada Ltd., Windsor, Ont.	3,253,176	3,773,043
Foster Wheeler Corp., New York	162,447	101,499*
Giddings & Lewis Machine Tool Co., Fort Collins, Colo.	359,575	249,454
Glenn L. Martin Co., Baltimore	2,349,355	1,144,858
Hamilton Bridge Co. Ltd., Hamilton, Ont.	82,089*	10,956*
Hayes Steel Products Ltd., Merriton, Ont.	79,808	76,486
Hudson Motor Car Co., Detroit	4,670,004*	670,716
Independent Pneumatic Tool Co., Chicago	288,047	1,153,639
Ingersoll-Rand Co., New York	5,219,188	9,726,411
Interlake Steamship Co., Cleveland	428,308	2,540,784
L. A. Young Spring & Wire Corp., Detroit	700,182*	1,477,089
Ludlow Valve Mfg. Co., Troy, N. Y.	32,377*	4,918*
Masco Screw Products Co., Detroit	20,038*	68,613
Midland Steel Products Co., Cleveland	1,450,573	2,320,811
Monroe Auto Equipment Co., Monroe, Mich.	4,880*	53,594
Motor Products Corp., Detroit	619,718*	2,147,130
New York Shipbuilding Corp., Camden, N. J.	532,894	1,372,038
Pacific Can Co., San Francisco	224,029	165,794
Packard Motor Co., Detroit	1,638 317*	3,052,212
Page-Hersey Tubes Ltd., Toronto, Ont.	736,952	1,033,280
Pennsylvania Coal & Coke Corp., New York	287,322*	198,422*
Pittsburgh Screw & Bolt Corp., Pittsburgh	350,948*	1,252,698
Pullman Inc., Chicago	2,295,829	12,275,950
Ralston Steel Car Co., Columbus, O.	128,842*	172,499
Sangamo Electric Co., Springfield, Ill.	519,725	976,996
Signode Steel Strapping Co., Chicago	138,813	408,516
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.	589,645	1,474,827
Sperry Corp., New York	4,961,398	2,949,860
Spicer Mfg. Corp., Toledo, O.	296,874	1,292,709
Standard Steel Spring Co., Coraopolis, Pa.	86,046	362,685
Thew Shovel Co., Lorain, O.	375,384	637,697
Troxel Mfg. Co., Elyria, O.	23,382	37,548
Union Metal Mfg. Co., Canton, O.	101,032	188,830
United Aircraft Products Inc., Dayton, O.	71,340	78,320
Warren Foundry & Pipe Corp., New York	281,053	567,911
White Motor Co., Cleveland	1,825,275*	65,854
Woodward Iron Co., Woodward, Ala.	532,881	1,177,512
Wright Aeronautical Corp., Paterson, N. J.	3,288,772	2,090,192
Yale & Towne Mfg. Co., Philadelphia	68,958	1,326,080

Sales Pointers From Manage

■ MODERN technical selli quires just as much care i planning as selling consumers E. O. Shreve, vice presiden eral Electric Co., declared bef American Management Conf New York, April 12-13.

Basis for such planning, h obviously must be different. kets should be studied by ind rather than by geographical se and considerable attention be given to the constant shift markets. Economic ups and differ in various industries an a more pronounced effect o nical sales than on consume sales.

To illustrate, Mr. Shreve cit current rise in aircraft an building, chemical industry a lic works as distinguished fr general level.

Real creative selling, he de grows from intelligent appl engineering. His own compa found necessary a continuing educational program to keep men, sales engineers and appl engineers up to date, not o sales methods and product also on product application.

Intelligent and aggressive and application engineering i nical selling, he said, often price competition. Many sal based on the confidence the has in the seller and such con in technical lines often rests type of technical service re

Discuss Departmental Func

Discussions of the functi production, sales, financial, management and other depar by leaders in many lines de varying, and in some instanc flicting, opinions as to the functions of each and their r ship to each other.

Raymond S. Perry, vice pre Ingersoll Milling Machine Co. ford, Ill., said keen interdepa tal competition is needed to intensive study of markets, s and products. Top manag however, should be strong to fix general policies, co-o departments.

Merrill B. Sands, president phone Corp., New York, f co-ordination between sales ments and top management. in time between granting of on new inventions and mass tion and sales of the new pro ascribed to lack of co-ordinat

Yesterday's rewards came

specialization, Mr. Sands
i, but he ventured the opin-
ose of tomorrow will result
ersatility. When sales man-
ecome more conversant with
tion, finance and other de-
nts, they will become candi-
for top management.
ature of the conference was
promotion exposition direct-
Leonard J. Raymond, presi-
Dickie-Raymond Inc. Dis-
were 50 sales presentations
g from elaborate campaigns
lets and salesmen's portfolios.
ntire session was devoted to a
sium on sales at which all
ments were represented.

nine Tool Orders inue To Increase

nestic machine tool orders in-
d in March, while foreign or-
eld at about the February
Total orders index of the
al Machine Tool Builders' as-
on, Cleveland, rose to 185.4,
red with 167.1 in February,
7 in March, 1938. March was
urth consecutive month to
an increase.
first quarter of 1939 shows
h better degree of participa-
the business placed by all
nies reporting than the last
r of 1938," the association re-
"The improvement in domes-
siness brings with it a better
ution of new orders, through-
e industry."

p Consumption s 78 Per Cent

nestic consumption of scrap
nd steel increased 78 per cent
first two months of 1939, as
lt of improved steel mill and
y activity, while exports de-
26 per cent, according to the
te of Scrap Iron and Steel
ew York.
ed upon a five-year ratio of
scrap consumption to steel
production, the apparent melt
ap in American steel mills
foundries in the first two
s was 4,613,000 gross tons.
ompares with 2,586,000 tons
period in 1938.
nwhile, scrap exports in the
wo months this year totaled
7 gross tons, against 613,327
the corresponding period one
go, according to the depart-
of commerce.

---

eling Steel Corp. has awarded
tract to Koppers Co., Pitts-
for designing and construct-
nzol refining apparatus and
nent at its Koppers by-prod-
oke plant, Follansbee, W. Va.

MEN OF INDUSTRY

■ WALTER F. MUNFORD has been appointed assistant to vice president in charge of operations, American Steel & Wire Co., Cleveland. He was superintendent of the company's Cuyahoga works in Cleveland.

H. L. Jenter, formerly assistant superintendent at Cuyahoga, now becomes general superintendent of the works, while J. D. Baster becomes superintendent of the cold rolled mills. A. G. Montgomery has been named superintendent of hot mills and V. H. Leichliter, superintendent of the wire mill. Mr. Jenter and Mr. Montgomery have been assistant superintendents at Cuyahoga, which positions have been abolished. Mr. Leichliter formerly

Walter F. Munford

was assistant superintendent at Newburgh wire works, and Mr. Baster, assistant superintendent of the North works, Worcester, Mass.

At Worcester, H. R. Rice succeeds Mr. Baster, while G. E. Hansen becomes foreman of the spring mill, South works, in place of Mr. Rice.

♦

Howard E. Oberg, vice president, Billings & Spencer Co., Hartford, Conn., has been elected a director.

♦

L. W. Greve, president, Cleveland Pneumatic Tool Co., Cleveland has been elected a director of Cleveland Graphite Bronze Co.

♦

Leslie C. Allman has been appointed vice president and director of public relations, Fruehauf Trailer Co., Detroit.

♦

J. L. Hyland, Chicago district operating manager, Republic Steel Corp., Cleveland, has been made chairman of the board of directors, Greater Chicago Safety council.

♦

O. L. Long has been named comptroller, Mercer Tube & Mfg. Co., Sharon, Pa., succeeding Irving Hill, resigned.

♦

Roger Waindle, formerly with Hoskins Mfg. Co., Detroit, is now sales manager, Fahralloy Co., Harvey, Ill.

♦

John E. Dixon, vice president, Lima Locomotive Works, Lima, O., has been elected president, with headquarters in New York.

♦

E. F. Entwisle, general manager, Lackawanna, N. Y., plant of Bethlehem Steel Co., sailed from New York April 7 for a Carribean cruise.

♦

J. R. Burkey has joined Union Metals Mfg. Co., Canton, O., as consulting engineer in the steel piling division.

♦

R. S. Van Note, since 1929 New England representative, C. M. Kemp Mfg. Co., Baltimore, Md., has been named assistant manager of sales.

♦

C. F. Hood, president, American Steel & Wire Co., Cleveland, has been elected a director, Cleveland chamber of commerce.

♦

H. B. Spackman, vice president in charge of sales, Lyon Metal Products Inc., Aurora, Ill., has been made a director.

♦

Paul A. Condit, development engineer, Mason-Neilan Regulator Co., Boston, since 1937, has joined the Cooper-Bessemer Corp., Mt. Vernon, O., as control engineer.

♦

W. P. Woodside, vice president, Climax Molybdenum Co., New York, has been elected a director, Reynolds Spring Co., Jackson, Mich., replacing John W. Miner, resigned.

♦

Lyon McCandless has been appointed vice president, H. K. Porter Co., Pittsburgh. Mr. McCandless also is vice president, Burgess Co. Inc., Beaver Falls, Pa.

♦

J. W. Brussel, factory manager, Federal-Mogul Corp., Detroit, has joined Bendix Aviation Corp., South Bend, Ind. He is succeeded at Federal-Mogul by E. C. Garlent.

♦

L. G. Hagen, assistant to the manager, western railroad sales, Carnegie-Illinois Steel Corp., Chicago, has resigned after 43 years of serv-

ice. D. V. Carlson, who became affiliated with the railroad sales office in 1926, will succeed him.

♦

David P. Graham, manager gas scrubber division, Peabody Engineering Corp., New York, is in Europe on a business trip. He will spend several weeks in England, Holland and France.

♦

George T. Power, district manager of the New York office of Scovill Mfg. Co., Waterbury, Conn., retired April 1 after 55 years' service in the company's sales department.

♦

W. E. Craner has been appointed representative in Houston, Tex., for Stearns Magnetic Mfg. Co., Milwaukee, maker of magnetic separators, clutches and brakes.

♦

Paul Smith, formerly production manager, Warner Electric Brake Mfg. Co., Beloit, Wis., has been named general manager, succeeding William J. Dunn, resigned.

♦

John W. Todd, affiliated for 18 years with Charles Dreifus Co., Pittsburgh, scrap iron dealer, the past ten years as secretary, has resigned.

♦

A. T. Colwell, vice president in charge of engineering, and J. D. Wright, secretary and legal counsel, Thompson Products Inc., Cleveland, have been elected directors.

♦

William E. Burns, heretofore supervisor of precision thread grinder assembly, Ex-Cell-O Corp., Detroit, has been added to the company's sales staff, machinery division.

♦

I. R. Bartter, formerly with the Minneapolis office of Lincoln Electric Co., Cleveland, has been placed in charge of the newly established office in Duluth, at 222 South Twenty-first avenue, East.

♦

Ray Applegate, the past four years with P. R. Mallory Co., Detroit, has been named Detroit agent by Thompson-Gibb Electric Welding Co., with offices at 4-120 General Motors building.

♦

C. R. MacBride has been named manager, engineering service department, A. M. Byers Co., Pittsburgh, being transferred from the Boston division sales office.

♦

William L. Stancliffe and Lester P. Philp have been appointed manager of miscellaneous sales and assistant to the comptroller, respectively, American Car & Foundry Co., New York.

♦

J. J. Mellon, assistant sales manager, Clark Controller Co., Cleveland, has been elected a director. He succeeds Harry K. Fisher, resigned. All other directors and officers of the company have been re-elected.

♦

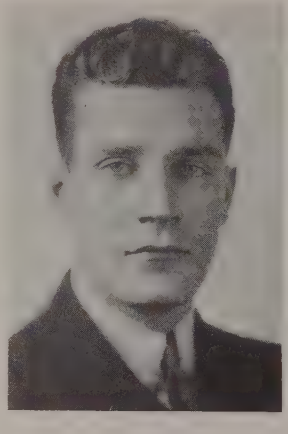
W. F. Pravel has been appointed district sales manager of Allegheny Ludlum Steel Corp.'s Houston, Tex., territory. He has been with the company since 1934.

♦

Willard Walker, former president and general manager, Walker Mfg. Co., Racine, Wis., has been elected chairman of the board. J. S. Allan is the new president and general manager.

♦

H. L. Berno, vice president, W. H. Davey Steel Co., Cleveland, has been elected president, succeeding William H. Davey, who continues as chairman and treasurer. Harold Davey, district sales manager at Detroit for a number of years, has



H. L. Berno

been elected vice president, and R. S. Easterday has been re-elected secretary.

Mr. Berno, a graduate of Ohio Wesleyan, began his business career with the Mansfield, O., works of Westinghouse Electric & Mfg. Co. He became associated with the Davey organization five years ago as vice president.

♦

L. Brewster Jackson has been appointed sales manager, Wickwire Bros. Inc., Cortland, N. Y., maker of wire cloth, netting and nails, succeeding George H. Kennedy. He has been associated with the firm 14 years.

♦

Clyde C. Mitchell has been appointed sales manager, Atlanta, Ga., district, Remington Arms Co. Inc. Formerly assistant sales manager for Remington's Minneapolis district, Mr. Mitchell succeeds Frank E. Morancy, resigned.

♦

Herbert L. Luria, Luria Bros. & Co., Inc., Philadelphia, has been appointed chairman and Arthur Price, Price-Watson Co., vice chairman, railroad scrap committee, Institute of Scrap Iron & Steel Inc., New York.

♦

N. J. Clarke, vice president in charge of sales, and C. M. vice president in charge of operations, Republic Steel Corp., Cleveland, were elected directors of the corporation at the annual stockholders meeting in Jersey City, N. J., April 12.

♦

Francis H. Brownell, chairman, American Smelting & Refining Co., New York, has been elected chairman, General Cable Corp., succeeding Walter Robbins, resigned. Arthur Potter, vice president, has been elevated to the newly created office of vice chairman.

♦

Henry W. Erickson, engineer of the crushing, cement and mining division of Allis-Chalmers Mfg. Co., Milwaukee, has been transferred to the El Paso, Tex., district office where he will specialize on mining machinery. He has been with Allis-Chalmers since 1929.

♦

Frank E. Ward will move from Buffalo to Rockford, Ill., where he will be sales representative for the American Steel & Wire Co. Previous to his return to Buffalo about a year ago, Mr. Ward was the company's sales representative in Peoria and Springfield.

♦

Edward J. Engel, executive vice president, has been elected president, Atchison, Topeka & Santa Fe Railway Co. He succeeds the late Samuel T. Bledsoe. Mr. Engel joined the Santa Fe in 1899 as a stenographer in the purchasing department.

♦

C. R. Stephens, affiliated with the Wickwire Spencer Steel Co., New York, the past 19 years, has been appointed acting district manager, Pacific coast district, with headquarters at 101 Townsend street, San Francisco. He succeeds the late H. A. Larsen.

♦

G. O. Rowland, associated with the Osborn Mfg. Co., Cleveland, for many years, the first three as sales representative in the Middle West, and the past year in the Cleveland office as manager of distributor sales, has been named advertising and sales promotion manager of the Osborn's brush division.

♦

A. J. Aulerich, identified with the Progressive Welder Co., Detroit, in the development of the first hydraulic welder ever built, and the past four years in company's Detroit sales and service division, has been transferred to Dayton, O., where

ndle sales in Ohio and In- His headquarters will be at ahan building.

♦

Chamberlain, district mana- ter Works Supply Co., Los and the United States Pipe dry Co., Los Angeles, since s been appointed manager, orks sales section, Crane Co., W. A. Dallach, with many experience in Crane Co. en- g and sales divisions, will Chamberlain's assistant.

♦

nder C. Brown, vice presi- eveland-Cliffs Iron Co., Cleve- nd W. C. Dressler, vessel r, Oglebay, Norton & Co., id, have been added to the f directors, Lake Carriers as- a, Cleveland. Oliver T. Burn- retofore assistant secretary ssociation, has been elected y, succeeding George A. ho continues as treasurer.

♦

ce G. Smith, formerly with Locomotive Works, Phila- and the Cramp Brass & Iron es Co., is now employed as presentative with the Birds- eel Foundry & Machine Co., ro, Pa.

♦

Harry D. Churchill of Case of Applied Science, Cleve- as been elected chairman, nd chapter, American Socie- Metals. Other officers elect- Vice chairman, Louis W. Aluminum Co. of America; r, Lewis F. Herron, James ron Co.; secretary, George s, Cleveland Electric Illumi- Co.

♦

. Sanborn, formerly district r of mechanical goods sales sburgh, Goodyear Tire & Co., Akron, O., has become r of all hose sales, with head- s in Akron. W. T. Bell, manag- department, has been placed ge of distributor sales, a new nent. C. A. Mathias, me- l goods salesman at Buffalo, n promoted to district man- mechanical goods at Pitts- R. W. Richardson, mechani- ds salesman in the Chicago y, has been transferred to , replacing Mr. Mathias.

♦

Cash, formerly superinten- Susquehanna Alexandria Republic Steel Corp., has ppointed general superinten- f Republic's Minnesota ore with headquarters at Hib- finn. W. M. Webb, hereto- perintendent of Republic's e and Ironton mines, has been general superintendent of its Michigan mines, with headquarters in Bessemer, Mich.

The division of Republic's northern ore mines into two districts follows the death of John E. Nelson, for many years manager of Republic's northern ore mines.

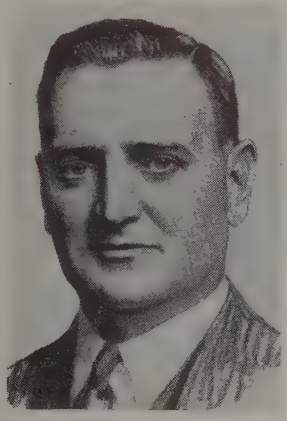
♦

H. C. Pletscher has been made Detroit representative of Precision Metal Workers, Chicago, a stamping firm, with headquarters at 704 Stephenson building.

♦

R. J. Knerr, since 1934 superintendent of maintenance, has been promoted to superintendent, Lehigh mills, Bethlehem plant, Bethlehem Steel Co. He succeeds Arthur C. Cusick, who will leave Bethlehem to become general superintendent, Crucible Steel Co. of America.

Other Bethlehem promotions include: L. J. Bray, general foreman,



Wallace G. Smith

locomotive repair shop the past seven years, becomes superintendent of maintenance, Lehigh mills, succeeding Mr. Knerr; A. W. Chenoweth, assistant superintendent of Lehigh finishing mills, has been made superintendent of these mills; Henry I. Maurer, heretofore assistant superintendent, has been advanced to superintendent of the 35-inch and 18-inch mills; H. L. Gifford, formerly assistant superintendent, has been appointed superintendent, treatment and cold drawn

(*Please turn to Page* 107)

DIED:

■ PHILIP E. BLISS, 53, president and a director, Warner & Swasey Co., Cleveland, in that city April 11. Mr. Bliss joined Warner & Swasey in 1910 as a junior clerk in the accounting department, became successively auditor, treasurer, vice president, and in 1928, president. He was born in North Fairfield, O., and attended Ohio Wesleyan university.

Mr. Bliss was a member of the executive committee, National Industrial Conference board; member, American Society of Mechanical Engineers and the Cleveland Engineering society; past president, National Machine Tool Builders' association; trustee, Case School of Applied Science. He had been a member of the NRA compliance board in Cleveland, was a member of the Army Ordnance association, was active in educational, financial and hospital activities.

♦

Watson A. Guthrie, 57, president and treasurer, Edward Ermold Co., machinery manufacturer, New York, April 1 in that city.

♦

Frank Myers, 59, president, treasurer and general manager, Poughkeepsie Foundry & Machine Co., and secretary and a director, Standard Gage Co., both of Poughkeepsie, N. Y., in that city, recently.

♦

H. A. Larsen, 54, manager, Pacific coast district, Wickwire Spencer Steel Co., New York, in San Francisco, recently. He was associated with the company since Jan. 1, 1934, directing sales of the company's products on the Pacific coast.

♦

Edward F. Goltra, 76, president, Mississippi Valley Iron Co., which has been inactive in recent years, and a director, American Steel Foundries, Chicago, in St. Louis April 2. At one time he was president, Missouri Iron Co.

♦

Maj. Matthew J. Hoff, 50, former vice president and general manager, Great Lakes Malleable Iron Co., Milwaukee, March 30 in that city. He joined the company following service in the World war and was active until ill health caused his retirement in 1932.

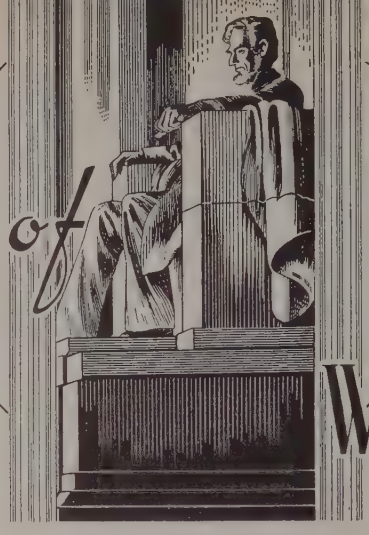
♦

Col. Samuel M. Nicholson, 78, president, Nicholson File Co. and American Screw Co., Providence, R. I., in that city, April 7. He joined the company in 1879, subsequently became secretary and vice president. He was elected president and general manager in 1893, succeeding his father who held these positions prior to his death.

♦

Edward Gray, 66, formerly chief engineer, Ford Motor Co., Detroit, in Detroit, April 2. Mr. Gray designed and installed the first large internal combustion engines in the old Ford Highland Park plant. He remained with Ford eight years. The last three years he devoted his time to designing a combination steam-diesel locomotive.

Windows of WASHINGT



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ UNITED STATES leadership in the Mexican machinery market gradually is being reduced as result of the barter agreements with Germany, Italy and Japan, a commerce department survey discloses.

In 1937, Mexican machinery imports totaled 78 million pesos, of which the United States supplied 57 million pesos and Germany 12 million pesos, or 74 per cent and 15 per cent respectively. For the first six months of 1938, total Mexican machinery imports were valued at 27 million pesos, of which the United States supplied 17 million pesos and Germany seven million pesos, or 63 per cent and 25 per cent respectively. A further reduction in the shipments of machinery is anticipated this year.

German participation in the Mexican machinery market is steadily increasing, especially in purchases by the Mexican government. In the petroleum field the government, finding it difficult to sell oil for cash in the world markets, is engaging in barter deals with Germany, Italy and Japan.

While only small amounts of German equipment have entered Mexico on the barter basis at this date, large quantities of German machinery including trucks, broadcasting equipment, machinery for highway construction, rails, pipe, compressors, rubber hose, diesel engines, power generating and transmitting equipment, and bridge steel are understood to be on order for future delivery.

Reached Peak in 1937

In former years Mexico took about 6 per cent of all United States machinery exports. Chief user has been the Mexican mining industry.

Shipments of machinery to Mexico reached a new high in 1937 due to the stimulus offered by purchases for irrigation, railway and highway projects sponsored by the Mexican government. The government program was severely curtailed near the close of 1937, however, resulting in a decline in American machinery exports to Mexico during 1938.

Expropriation of the privately owned oil properties in March, 1938, resulted in a withdrawal of capital from Mexico and for a period caused practically all Mexican industries to retrench rather than to go forward. The Mexican government, since that date, has purchased practically no oil refinery equipment, all of which formerly came from the United States.

German participation in the export machinery trade to Mexico is most sharply felt in the textile field. Importation of textile machinery from the United States dropped sharply while Germany increased her trade with Mexico and is shipping large numbers of textile winder machines.

Germans Liberal with Credit

One factor in increased German trade with Mexico, besides the barter program, is the low price of German goods. In some cases German prices are from 30 to 40 per cent below those of competing United States equipment. German credit terms have also been unusually liberal, extending from one to one and a half years with little, if any, down payment.

To date Germany has had no particular success in competing with United States shoemaking machinery and practically all Mexican shoe machinery and equipment still is purchased in this country, although a few German stitching machines have been imported. One reason advanced for the failure of Germany to compete in the shoe equipment trade is the lack of durability of the German-made machinery.

United States exports of lumber machinery to Mexico have decreased from $100,000 ann
normal times to from $3
$35,000 per year.

Because of the economies
ed by the Mexican governm
ing 1938, American exports
way equipment dropped
The government owned
railroads purchased only
ties. Purchases of machin
irrigation purposes were al
tailed in 1938.

"DON'T MUTILATE LABO
PLEADS SENATOR WAGN

Senator Wagner, New
author of the national labo
tions act, appeared last w
first witness before the sena
cation and labor committee
on proposed amendments.

Following the senator's tes
the committee adjourned unt
day, April 17. During the w
April 17 it is expected variou
bers of congress, both fo
against amendments, will
Many other groups will be
Indications are the hearing
drag along for four or five
and there is a charge of "st
by those who favor amendm

Senator Wagner told the c
tee the proof is overwhelmi
the labor act in its broad
"has proved an effective inst
for economic peace and ind
justice." He contended the a
benefited workers and em
and the public at large. "N
said Senator Wagner, "cha
its objectives; no responsible
openly advocates its repeal.
diminution of its effectiveness
be a national evil; its mut
would be a national calamity

"The amendments pretend
make the act 'fair' by placin
restraints on labor would in
fect upset labor's new equal
bargaining power, and resign
to its earlier status of the eco
underling."

CIO last week charged

SUBTRACT and you ADD WITH THE

Speed Nut System (PATENTED)

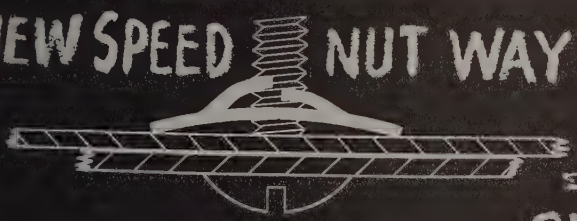
SUBTRACT— NUMBER OF PARTS HANDLED *and you* **+ADD** SAVING

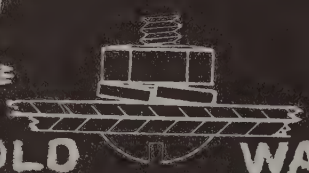
SUBTRACT— VIBRATION LOOSENING *and you* **+ADD** TO QUALITY OF PRODUCT

SUBTRACT— PRODUCT DAMAGE FROM FAULTY FASTENINGS *and you* **+ADD** DEFINITE COST SAVINGS

SUBTRACT — ½ YOUR ASSEMBLY COST *and you* **+ADD** THAT TO PROFIT SIDE OF LEDGER

NEW SPEED NUT WAY





OLD WAY

SPEED NUTS are manufactured from high carbon spring steel to provide positive holding power for the life of the product. Made for most standard sizes of machine screws, stove bolts, metal screws, metal rivets and plastic studs. Many special shapes and sizes also developed for mass production products. Write today for samples, stating sizes you want and where you expect to use them.

SPEED NUT DIVISION TINNERMAN STOVE & RANGE CO.
2039 FULTON ROAD, CLEVELAND, OHIO
Manufacturers of Patented SPEED NUTS

President Green with entering into a "definite conspiracy" with the National Association of Manufacturers and the United States chamber of commerce to break the Wagner act.

"Examination of the NAM proposals and those announced by the chamber of commerce shows that they are in many respects startlingly similar to the amendments advanced by Senator Walsh and sponsored by William Green and his associates," the committee said.

INDUSTRY TO TELL OWN STORY BEFORE TNEC

Temporary national economic committee last week announced a new phase of its studies which, according to Senator O'Mahoney, chairman, will enable business and industry to present its own story of the nation's economic problems. This shift in plans reportedly is being made partially, if not wholly, because of the crude way in which the federal trade commission handled the steel hearing.

Committee members and officials of the trade commission severely criticized the way the steel case was presented. It was so one-sided, in fact, that Chairman O'Mahoney declared it could not be considered to be the attitude of the economic committee toward the steel industry.

PROPOSE BARTER DEALS TO OBTAIN CRITICAL MATERIALS

Several weeks ago when the strategic minerals bill was before the senate, Senator Lodge, Massachusetts Republican, offered an amendment by which this country would accept strategic minerals from foreign countries on credit against war debts. The amendment had no chance of adoption.

However, last week Senator Byrnes, South Carolina, apparently with the sanction of the administration, suggested the state department undertake to find out whether certain other governments would be willing to enter into an exchange of raw materials reciprocally desired for emergency stock purposes and for such purposes only.

The state department said from the American point of view it would be useful for our government to acquire for a long-term storage reserve stocks of certain materials not produced within the United States or produced only in limited quantities. Various executive departments, the state department points out, have strongly indicated this policy in their support of the several bills now before congress for acquiring such reserve stocks by purchase.

The state department said: "It is our sincere hope that this legislation will be passed.

"The appropriations available under such legislation, however, will not be sufficient to make possible the acquisition of adequate supplies. Therefore, if it proves to be possible to secure some of these supplies by direct exchange for some of our surplus wheat and cotton which other governments might wish to store for emergencies, such interchange ought to be mutually beneficial. Such arrangements would fall completely outside of the sphere of ordinary commercial interchange and would not affect the sphere of operation of the trade agreements program or any of our other general policies."

WHEELER-TRUMAN BILL OPPOSED BY INDUSTRY

The steel industry has shown considerable interest in S2009, the Wheeler-Truman bill, a provision of which prohibits a carrier from transporting commodities owned by its parent company. Such a prohibition would affect railroads owned by industries, pipe lines and some water carriers.

It is reported it was the intent of the bill's authors to make the clause apply to such roads as the Elgin, Joliet & Eastern, an affiliate of the United States Steel Corp., which the Supreme Court held was not subject to the present commodities clause. Senator Wheeler said he was "very doubtful whether anything so drastic should be included in the bill."

PUBLIC CONTRACTS BUREAU RE-DEFINES "DEALER"

Bureau of public contracts has amended its definition of "dealer":

"A regular dealer is a person who owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and sold to the public in the usual course of business."

Bureau defines a machine tool dealer as follows:

"A machine tool dealer may be a person possessing, through contract or agreement with a manufacturer, the responsibility for selling that manufacturer's products, with respect to a specific territory and who is authorized by such manufacturer to offer its products and to negotiate and conclude contracts for the furnishing thereof; provided, that upon all orders to manufacturers for direct shipment to the United States he agrees to insert a notice to the manufacturer to the effect that the supplies are purchased for the United States and that the manufacturer is within the
article 104 of these regul
quiring compliance with
visions of the 'public contr

APPELLATE COURT RU ON IMPORT DUTY PRO

Associate Judge Jackso
United States court of cus
patent appeals ruled last
import duty on galvaniz
gated iron sheets in the
Otis McAllister & Co. ag
United States.

Galvanized corrugated ir
were assessed at 75/100 o
per pound as corruga
sheets, plus 2/10 of 1
pound for being galvanized
ers protested they were
dutiable at 1/5 of 1 cent p
or at 20 per cent as s
shapes of iron or steel. T
ed States customs court o
the protest and the court
ment was affirmed by the
appeals.

EDWARD J. NOBLE NAM ASSISTANT TO HOPKINS

Edward J. Noble, chairm
aeronautics authority, has
to become associated with
tary of Commerce Hopkins

For the present, Mr. No
act as a dollar-a-year man
tive assistant to the secretar
ever, Mr. Hopkins will ask c
to create an under-secretary
the commerce department
to the position now existing
eral other departments. If t
position is created, Mr. No
out-rank Assistant Secretar
terson and Johnson.

According to informatio
available, Mr. Noble will su
the bureau of foreign and d
commerce. Mr. Noble is a
lican and founded Life Sav

In addition to being the p
stockholder in Life Savers I
Noble has been a stockhold
director in various business
rations including Drug Inc.,
Bag and Paper Co., Com
Bank and Trust Co., and Sta
Industry Inc.

GOVERNMENT IRON, STEE AWARDS TOTAL $327,700

During the week ended A
the government purchased
700.54 worth of iron, steel, an
products under the Walsh-
act as follows: Steel Improv
& Forge Co., Cleveland, $21,
Midvale Co., Washington,
325; Diebold Safe and Loc
Canton, O., $14,944; Young
Sheet & Tube Co., Youngstow
$11,512.49; Carnegie-Illinois
Corp., Washington, $19,327.95
Mfg. Co., Louisville, Ky., $20,
and Protectoseal Co., Chicago,
300 (estimated).

...ATION

...NG AIRCRAFT BUILDERS ...90% GAIN IN PROFITS

...TRASTING with the re- ...ncome generally experienced ...istry in 1938 are the sub- ...y higher profits reported by ... manufacturers. Seven lead- ...lders, representing 80 per ... total output, show net in- ...ggregating $17,403,068, a 90 ...t gain over their $9,163,233 ...

...by these seven companies ...ur amounted to $142,166,408, ...d with $102,164,957 the pre- ...ear.

...as Aircraft has awarded ... to the Austin Co. for con- ...g a 120 x 340-foot addition ... El Segundo, Calif., plant. ... about $50,000, the new unit ... equipped with tram rail and ...n crane.

... Aircraft Corp., Wichita, ...now negotiating for a site ...ustin, Tex., proposes to con- ...t factory costing up to $1,- ... for manufacturing planes ...ts.

...o has concluded an agree- ...th Canadian Car & Foundry ...L., Montreal, whereby mili- ...planes will be built in Mex- ...vernment is to erect factory, ...n Car to equip and operate ...nes, propellers, instruments ...v materials are to be pur- ...in the United States.

...ian Associated Aircraft ...ronto, soon will receive bids ...50,000 extension to its plant ...on, Ont.

...w Aircraft Co., Alhambra, ...proposes to issue $500,000 in ... acquiring plant and assets ... ow Engineering Corp., Los ... Funds are being allotted for new equipment and metalworking machinery.

Army air corps will open bids at Wright field, Dayton, O., July 5, for light primary training craft; and July 6, for interceptor pursuit planes. Bids will be taken up to the same week on eight other types.

Recent federal orders for aeronautical equipment: Treasury department, Grumman Aircraft Engineering Corp., Bethpage, L. I., airplanes, $204,000; army, Air Cruisers Inc., Clifton, N. J., oxygen cylinder assemblies, $41,790; and navy, Breeze Corporations Inc., Newark, N. J., weather instruments, $24,050.

Ryan Aeronautical Co., San Diego, last week booked a $200,000 contract for engine parts and accessories from Lockheed Aircraft Corp. Material is needed in filling Lockheed's foreign orders.

Plan Seaplane Bases

Seaplane bases at 150-mile intervals along the Atlantic seaboard are planned by Civil Aeronautics Authority. Municipalities and National Youth Administration will co-operate in constructing standardized wood and steel floats, more than 50 of which are already scheduled for completion by midsummer.

New type of electrically-welded hollow steel propeller blade which is said to weigh 25 per cent less than standard models has been developed by Lycoming division, Aviation Mfg. Corp., Williamsport, Pa. It is fabricated from a single length of seamless chrome-nickel-molybdenum steel tubing.

Improved ignition and greater engine efficiency are claimed for a new airplane ignition cable announced by Sterling Cable division of Electric Auto-Lite Co., Port Huron, Mich. Featured is the use of seven strands of stainless steel wire.

Defines Safety's Dollar Value

■ MONETARY as well as humanitarian benefits result from effective safety programs, Edward R. Granniss declared before the annual convention of the Greater New York Safety council in New York recently. Mr. Granniss is director of the industrial engineering division, National Conservation Bureau of the Association of Casualty and Surety Executives.

An employer actually pays four times the combined medical and compensation costs for an occupational accident, he estimated, on basis of a national study including several thousand cases.

Mr. Granniss cited the effectiveness of the United States Steel Corp.'s safety program. In 25 years, the rate of serious and fatal accidents in subsidiary companies was reduced more than 50 per cent. He estimated more than 70,000 workers have been saved from serious injury or death by the program.

"If we place a value of $5000 on each of these bad accidents, there is a monetary saving of $350,000,000," he continued. "The corporation estimates it spent some $26,000,000 since 1912 to promote safety work. Deducting $26,000,000 from $350,000,000, a saving of more than $300,000,000 is indicated."

■ Ford exposition visitors at the New York World's fair will see a 160-ton press producing inner shells for automobile hub caps at a cost of 12 and a fraction cents each, while beside it a skilled workman pounding with hammers will produce the same cap by hand at a cost of at least $2.50.

■ **Stripped of its fuselage covering, this North American attack-bomber reveals the maze of metal parts comprising a modern airplane. Used in this craft are aluminum alloy shapes, and seamless chrome-molybdenum steel aircraft tubing, made by National Tube Co. View at top looks into rear cockpit from right side**

Judge Them by PAST PERFORMAN

—and it will be Hyatts Again

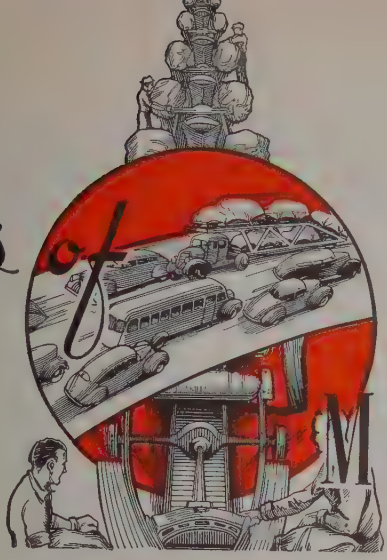
In the tables at the Youngstown Sheet and Tube Company's new seamless tube mill, as illustrated, Hyatt Roller Bearings are employed. They are likewise serving in other Youngstown units—the strip mills, cars, motors, and so on.

Past dependable performance in Youngstown equipment, we like to feel, had considerable to do with the continued use of Hyatts. Repeat order after order, in mill after mill, like this makes Hyatt a dominant bearing in steel mill service.

Where and when can we serve you? Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey; Detroit, Chicago, Pittsburgh and San Francisco.

HYATT *Roller Bearin*

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

ECTS for spring business industries hinge impor- the outlook for automo- uction this month and rmally these two months periods for the year in tail demand. Hence busi- rally is vitally concerned tatus of retail demand for now.

d reports would indicate ers of automobiles are ng to salesrooms in the d numbers this spring.

t place to get an answer uestion is on the firing n automobile salesmen ily bread is dependent ir ability to persuade uy. Here, then, are com- m a new representative approached at random in s in this city, some in pulated centers and some sections. They were in- without previous warn- heir replies came on the e moment, precluding pos- carefully prepared state- ch probably would not re- e picture. They say:

-*LaSalle salesman*—

in the middle classes just buying mood, and when llows note this hesitancy hold back on purchases. ar stocks are on the low some cases it takes two delivery of a car. But been no spring rush as

tally, the automobile different today than it ago. Today people spend y as fast as they get hold hen times get a little bad no funds. Years ago aside a little cash so that mes of stress they had money with which to buy cars if the desire and need dictated.

"I don't believe the stock market collapse or the European war scare can be blamed for failure of spring business to develop."

A Chevrolet salesman—

"These days the competition for new car sales in the low-price field is terrific—you practically have to go out and buy the business. Most dealers are 'off the book' on trade-in allowances and we have to make some pretty fancy offers to close orders. Our business on the floor has dropped to practically nothing. Last month I worked seven nights and did not sell a single car.

"The sales I have been able to make resulted from telephone contacts with present Chevrolet owners. Even our transient business has disappeared. We sold a number of cars in 1937 to people just passing through enroute from California; this year we haven't seen any customers of this type.

"I think prospective customers have the money to spend, but they are just sitting tight at present.

"One factor which we do find hurts car sales is the widespread building of homes by people in moderate circumstances. Making the down payment on property and meeting monthly payments means many must postpone buying a car."

A Ford salesman—

"The public isn't buying cars this spring; it has to be sold. And that's

Suggests the Power of Suggestion

■ "WHEN I was 19, my brother *suggested* we form a partnership to sell tires and accessories. When we needed more space the auto dealer who occupied the space we wanted *suggested* we buy the agency and his lease.

"Then my distributor closed up and a friend *suggested* I come to West Texas where a distributorship was open. The manufacturer shipped me a lot of extra cars without any *suggestion* how I could sell them, so I was well-loaded when the cotton crop failed.

"New models were announced and the factory *suggested* I take an extra carload of old models with each carload of new ones. When I declined they *suggested* I retire, as they had found an old farmer who had sold his land and wanted his son to be a big business man.

"A new oil field opened nearby, so my brother *suggested* I start anew as a dealer with a better manufacturer. The boom was on and I sold a lot of cars and trucks. Then my wife *suggested* I buy out the leading agency.

"I became the biggest dealer in the oil field, and at the *suggestion* of the factory I put my profits back in the business. The oil boom collapsed.

"The factory diverted a lot of cars from the railroad tracks to me, and I *suggested* they keep them. They *suggested* I take them —or else. I elsed.

"After two years of *suggestions* by practically all auto manufacturers, I decided to try it again as a multiple dealer. Within 18 months the manufacturer *suggested* I become the biggest dealer in town. I *suggested* more time was needed; they *suggested* more registrations, and I retired again.

"Recently in Detroit a friend *suggested* I take advantage of the upswing in the automobile business, and I *suggested* he go straight to hell."—Letter to *N.A.D.A. Bulletin*

a tough battle in many cases. Furthermore, I believe prices are too high. A man cannot comfortably pay out $235 for a down payment and then meet 18 monthly payments of $35 if he is only working two or three days a week and is not sure how long that will continue. But if you offer such a man a cheaper car, even though he could pay for it he doesn't want it because it necessarily must be substandard in appearance and accessories. Our deluxe models are far outselling standard models, which indicates buyers with standard pocketbooks want deluxe cars—and it just can't be done.

"Personally my April business has exceeded my March business for the same period, but I have been lucky this month and had a poor couple of weeks early in March. For our branch as a whole, business this month has been far below expectations."

A Buick salesman—

"I am afraid I don't know much about it. You had better talk to the sales manager over there."

A DeSoto-Plymouth dealer—

"In 1937 about 80 per cent of our business was with employes of the Chrysler Corp. Right now less than 10 per cent of our sales are to this class of buyer. We have had to write off factory workers as prospects for the time being and concentrate in other fields. I believe people generally are being frightened by newspaper headlines about the European situation and the stock market. We also notice that every time some development in Washington occurs which is favorable to business, our inquiries pick up surprisingly. Then in a day or so some decision will be made down there which can be construed as hurting business and our friends stop coming in to look at cars.

"We don't know what to expect the rest of this month and next. Right now our sales are not showing much improvement over March, but of course they are a lot better than last year at this time. I think a week or two of warm spring weather could do a lot toward bringing buyers out of their shells."

A Pontiac salesman—

"Everywhere you turn you see people scanning the newspaper headlines to find out what is happening in Europe and how far stocks have dropped in price. Even though they know these matters may not concern them directly, nevertheless they are scared out of spending their money by disturbing headlines in newspapers.

Normally in the spring over 60 per cent of our business is from buyers who just drop in while passing our store and are not contacted first by salesmen. But so far this year, there has been almost no business of this sort. I am convinced people have the money to buy; they are just being scared into sitting tight.

"Of course the weather so far has been terrible for new car sales, and we hope that in the next few weeks warmer weather will bring out a flock of buyers."

Summarizing these heterogeneous and perhaps hasty opinions, the following appear to be reasons why new car sales are not showing the hoped-for zip:

Fear engendered by news reports from Europe.
Lack of support from the factory-worker class of buyer.
Adverse spring weather.
Competitive situation on trade-ins.
High prices.

■ THIS week the nation's auto dealers will convene in San Francisco and attempt officially to find out what is wrong with business conditions. It is to be hoped they will be successful, especially when consideration is given to a recent analysis prepared by the dealers' association which shows that 160 representative dealers in 1938 made an average operating profit of only 76 cents per new car sale, and an overall net profit of but $4.25 per new car sale or 0.21 per cent on total sales of better than $50,000,000. The report shows this group of dealers did 73.8 per cent as much business in volume of sales in 1938 as in 1937, and realized only 11.23 per cent as much net profit. A marked increase in rati cars sold per new car shown—2.28 compared 1937. This partly expla ordinate drop in opera compared with gross sa

As far as automobile are concerned, the brig appears to be at Dodge w parts releases have be 9800 units, and a simila effected in May schedu where the trend is fairly

Packard, with M. M. G at the helm, succeeding cauley who has resigned chairman of the board, i about 12 days total prod month, to be followed b mated six-week shutdow transfer of a large amou chining and other equipr buildings on the south si Grand boulevard to the pl north side.

March retail sales fo leaders in the low-price 88,836 units for Chevrol 345 for Ford, increases o 56 per cent, respectiv March a year ago. The ures include Mercury sa totaled 7079 units, larges movement since the car duced last November. T figures compare with esti tory output of 90,000 for and 82,300 for Ford-Merc

Automobile Manufactu ciation estimates Marc sales of cars and trucks units, compared with February.

■ INDUSTRIAL pep se held in this city last week rection of the board of an event designed to fulfil purpose of reaffirming Detroit's faith in the futu plenishing the ranks of b bers. Adopting the slog ing Stops Detroit," the ci tries set up displays in areas, contrasting present with those made ten Climax was an industrial dinner at which Fred M. Chrysler Corp. and C. F. of General Motors Rese featured speakers, before ence of about 800.

In characteristic vein, M ing observed: "When we l ward, everything is ve Looking forward all is fo of one thing we may be that we are on the verg greatest industrial renais world has ever known, a need do is to go ahead in faith that some of the n being uncovered by science will some day be able value to the world. when the value will appe not worry us."

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

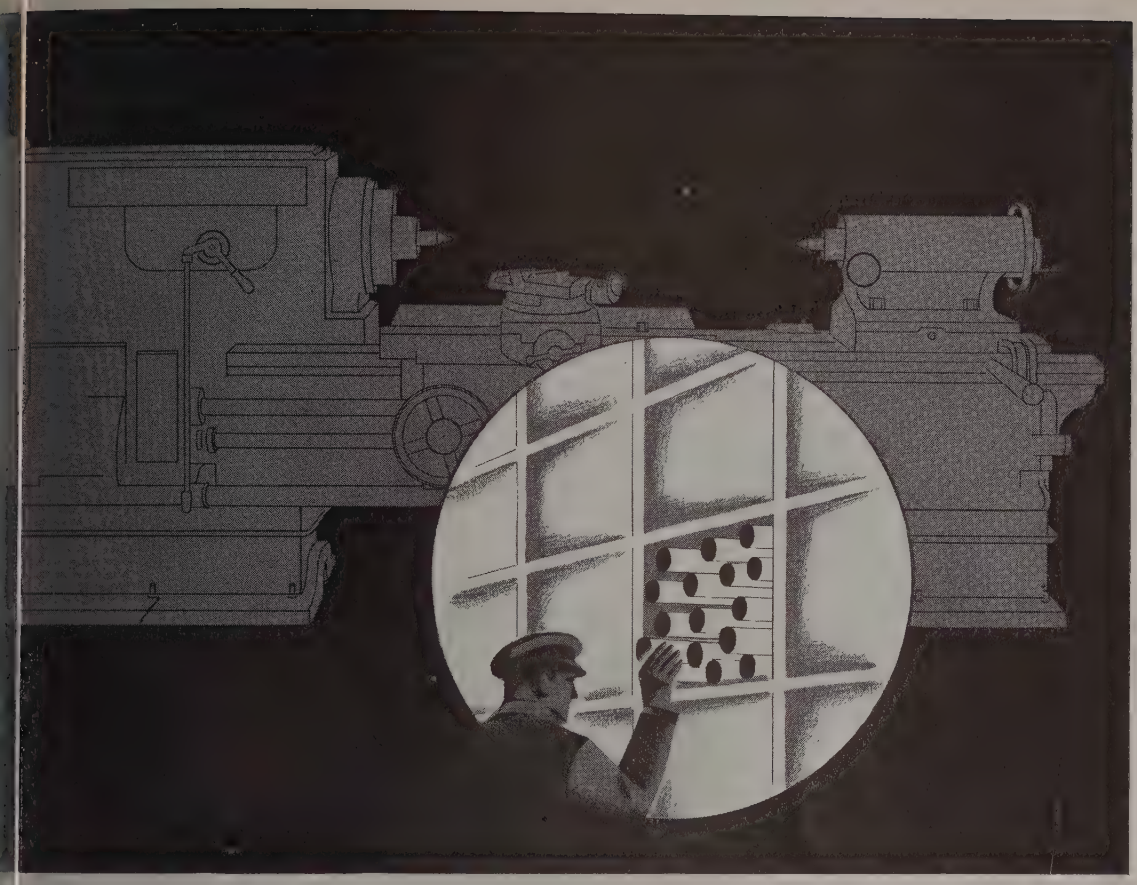
	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	312,141
March	519,022	238,598	.....
April	553,231	238,133	.....
May	540,377	210,183	.....
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
March 18	86,725	57,555
March 25	89,400	56,800
April 1	85,980	57,500
April 8	87,019	60,975
April 15	88,050	62,021

†Comparable week.

	Week Ended April 15	Week Ended April 8
General Motors	34,680	32,735
Chrysler	20,725	20,525
Ford	22,230	22,230
All others	10,415	11,529



THE FEWER, THE BETTER

and of the times for more production per dol-
out sacrifice in quality, brings into sharper
rper focus the necessity for the use of the
dern materials. It is natural that the more
steels specified in machine construction, the
he fabrication and stock room complications.
duce these complications, many manufac-
re taking advantage of the versatility of
num Steels. One, a builder of a varied line of heavy duty machines, replaced four different alloy steels with Chromium-Molybdenum Steel (SAE 4140) for everything from heavy crank shafts to small screw machine parts.

Overhauling your own material specifications may disclose similar opportunities for highly profitable standardization on a versatile Molybdenum steel. To assist you we will gladly send our technical book "Molybdenum in Steel", free upon request.

ERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

MOLY

max Mo-lyb-den-um Company
0 Fifth Avenue · New York City

Activities of Steel Users, Makers

■ REPUBLIC STEEL CORP.'S Ideal Foundry Co., Beaver Falls, Pa., will be moved to Newton Falls, O., where it will occupy about 60,000 square feet in the old Newton Steel plant, and employ about 100 men.

Republic acquired Ideal Foundry in the merger of 1930. Fire in the Beaver Falls plant hastened decision to move. The Newton plant has excellent facilities, railroad sidings and cranes. Transfer will take several months, without interrupting operations.

♦

Keystone Steel & Wire Co., Peoria, Ill., which this year is observing the fiftieth anniversary of its founding by Peter Sommer at Tremont, Ill., has established a new warehouse at Oakland, Calif. It will be a central distribution point for the company's other West coast warehouses at Los Angeles, Seattle, and Portland, Oreg., with Carl E. Simon, West coast manager, in charge.

♦

Bjerre Machine & Accessory Co., 920 West Washington boulevard, Chicago, has been organized by Folmar Bjerre, formerly associated with J. N. Fauver Co., Detroit, to handle specialized industrial fabricating machinery and accessories.

♦

Orders received by Trane Co., La Crosse, Wis., maker of air conditioning equipment, in first quarter this year were the second largest in its history, amounting to $1,226,156, or 42 per cent more than in the first quarter of 1938.

♦

Andrews Steel Co. Newport, Ky., has awarded to J. & F. Harig Co., Cincinnati, contract for excavation, piling, reinforced concrete and structural steelwork for a building, 90 x 125 feet, to be constructed at Newport for the new bar mill.

♦

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed the following representatives: Quinn R. Barton Inc., 1305 West Forsyth street, Jacksonville, Fla.; Fuchs Machinery & Supply Co., 1102 Farnam street, Omaha, Nebr.; Great Lakes Supply Corp., 324 West Thirty-sixth street, Chicago.

♦

McKay Co., Pittsburgh, maker of tire and commercial chains, and arc welding electrodes, has transferred its general sales, order, invoicing and purchasing departments from Pittsburgh to its York, Pa., factory. Executive departments and officials and a district sales office will remain in the McKay building, Pittsburgh.

♦

Harnischfeger Corp., Milwaukee, has moved its Detroit district offices to new quarters at 845-46 Book building.

♦

Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., has been licensed to produce Ledloy, lead-bearing steel developed by Inland Steel Co.

♦

Mullins Mfg. Corp.'s pressed steel division at Youngstown, O., has business on hand necessitating 24-hour operations. As result of an improvement program undertaken to meet production requirements of a contract with Sears, Roebuck & Co., the company has widened its range of products and lowered costs.

♦

Vascoloy-Ramet Corp., North Chicago, Ill., has started operations in its new plant, 415 Tonnelle avenue, Jersey City, N. J., for production of tantalum carbide wire, tube, sectional and shape dies, cutting tools and blanks. Operations are in charge of John Kontra, Joseph Hall and John Adler, formerly with Union Wire Die Co. District sales and service are handled by Hayden G. Fulton, formerly at the North Chicago plant.

♦

Six slide gate valves of special bronze alloy to resist the corrosive effect of polluted water in the new Mahoning flood control dam above Pittsburgh, are to be fabricated by Koppers Co. at its Bartlett Hayward division, Baltimore. Each gate will be 10 feet by 5 feet, 8 inches. Contract has been awarded by war department's Pittsburgh district engineers.

MEETINGS

BRITISH STEEL INSTITUTE TO CONVENE IN LONDON

■ BRITISH Iron and Steel institute will conduct its annual meeting at the Institution of Civil Engineers, London, May 3-5. Features will include presentation of the Bessemer gold medal for 1939 to James Henderson, and announcements concerning other awards, including the Andrew Carnegie gold medal for 1938, and the Williams prize for 1938. Many technical papers and reports will be read. The institute's autumn meeting will be held in Great Britain, probably Sept. 12-16.

OHIO CHAPTERS OF A.S.M. MEETING IN CINCINNATI

Series of lectures and discussions on "Unusual Surface Hardening" will feature the ann of Columbus, Dayton and chapters, American Socie als, Alms hotel, Cincinna The Ohio Valley section, Institute of Mining and gical Engineers, will part

Papers scheduled: "Fl ening," by Stephen Smi duction Sales Co., New Y Facing Alloys and The tion," by R. L. Lerch, Hay Co., Kokomo, Ind.; "Silic nation," by Harry K. In Steel Tubes Co., Milwauk

STEEL ENGINEERS TO PLANTS IN YOUNGSTO

Cleveland and Pittsb tions, Association of Iron Engineers, will hold a j ing at the Ohio hotel, Yo O., May 2. Forenoon wil visiting Youngstown Shee Co.'s Brier Hill plant. L be served at the hotel a afternoon the engineers the company's new sean mill at the Campbell work

Two papers will be pre the dinner meeting in the "Development and Latest Seamless Tube Mills," by son, general manager, Ae ard Engineering Co., You and "Application of A Bearings to Seamless Tub by S. M. Weckstein, Timk Bearing Co., Canton, O.

COOLIDGE TO GET FAR MEDAL AT A.I.E.E. MEE

A feature of the Nor district meeting of the Ame stitute of Electrical Engi Hotel Kimball, Springfiel May 3-5, will be the presen the Faraday medal for 193 W. D. Coolidge, director o search laboratory, General Co., Schenectady, N. Y. Th is awarded each year by t tution of Electrical Engin Great Britain for notable and industrial achievement trical engineering.

Among papers scheduled vention sessions is "E Equipment on Machine To B. P. Graves, Brown & Shar Co., Providence, R. I.

Shipbuilding Promis Continued Activity

■ Ships under construction classification April 1 repr smaller tonnage than on M but substantially above a ye according to a report by Am bureau of shipping, New Yo

Vessels building April 1 bered 165, or 678,750 gross

80, or 697,110 tons March 5, at 389,275 tons, April 1, ie April total includes 73 craft, 634,350 tons. Dur- h 13 vessels, 4550 tons, ed.

rable new work is expect- ne out for bids within the weeks. United States mari- mission plans to award in June for about 12 C-1 ssels of 8000 gross tons number of high-speed tank- under consideration and vy vessels are to be bid ay 24. Maritime commis- xpected to ask bids before hree high-speed passenger r Oriental service. Little t ship work has been fig- ently except the aircraft on which Newport News ing & Dry Dock Co. was bidder.

isin Prohibits ger" Picketing

nor Julius P. Heil, Wiscon- signed a bill defining labor limiting the term to actual nents between employer loyes resulting in a strike t. The purpose is to enable nent of an injunction picketing by organizations to force employes into union ranks, so-called "stranger picketing." The new definition of a labor dispute is, "only as between an employer or association of employers and two or more of their employes or their representatives; and no labor disputes shall be deemed to exist unless the controversy results in a strike or lockout."

Steel Corp. Shipments 42.8 Per Cent Over '38

■ United States Steel Corp.'s finished steel shipments in March totaled 767,910 tons, or 89,916 tons, 13.26 per cent, over February, and 195,711 tons, 34 per cent, over March, 1938. Three months shipments were 2,235,209 tons, compared with 1,565,244 tons in first quarter, 1938, an increase of 42.8 per cent.

(Inter-company shipments not included)

(Tons)

	1939	1938	1937	1936
Jan.	789,305	518,322	1,149,918	721,414
Feb.	677,994	474,723	1,133,724	676,315
March	767,910	572,199	1,414,399	783,552
April	.....	501,972	1,343,644	979,907
May	.....	465,081	1,304,039	984,097
June	.....	478,057	1,268,550	886,065
July	.....	441,570	1,186,752	950,851
Aug.	.....	558,634	1,107,858	923,703
Sept.	.....	577,666	1,047,962	961,803
Oct.	.....	663,287	792,310	1,007,417
Nov.	.....	679,653	587,241	882,643
Dec.	.....	694,204	489,070	1,067,365
Adj.*	.....	‡30,381	†77,113	†40,859
Total	.....	6,655,749	12,748,354	10,784,273

*Yearly adjustment. †Deduction. ‡Increase.

e Cast-Iron Vulcan Overlooks Birmingham

statue of Vulcan, Roman ire and metalworking, has ted on Red Mountain, over- Birmingham, Ala. It is 55 h, weighs 100 tons, sur- a tower 124 feet high, giv- n elevation of nearly 600 e the city.

ed to be the second largest America and the world's ast iron figure, Vulcan has eventful history. Designed oretti, an Italian sculptor, st in Birmingham from iron m local ore by Sloss fur- v part of the Sloss-Sheffield ron Co. plant. Birmingham ial club sponsored the s an exhibit at the St. Louis a Purchase exposition in eglected for several years return, it finally was erec- air park, site of Alabama's r.

5 Thomas N. Joy, an Ala- ngineer, and the late J. Barnett, past president, Ki- nternational, proposed that place Vulcan on the moun-

17 has been set for dedica- monies.

Ohio Society Honors Steelmen

■ T. M. GIRDLER, chairman, Republic Steel Corp., Cleveland, appealed to business and industry to support amendments to the Wagner act to make it a law beneficial to all who work, at the fifty-fourth annual dinner of the Ohio Society of New York, in New York last week.

If such changes are made, he expressed confidence "the industrialists and the so-called economic royalists won't have any fault to find with it."

Mr. Girdler spoke at a dinner dedicated to the honor of Ohioans in the steel industry, with approximately 300 present. Others at the speakers' table included William A. Irvin, former president, United States Steel Corp. and now a member of its finance committee, and a director, and William Haig Ramage, president, Valley Mould & Iron Corp., Hubbard, O.

Sees Anti-New Deal Trend

Many prominent in the steel industry were present. Others, unable to attend, sent greetings, including Benjamin F. Fairless, president, United States Steel Corp.

Wendell L. Willkie, president, Commonwealth & Southern Corp. and a former head of the society, paid warm tribute to "the great industrialists of America, the Girdlers, the Irvins" for building the country. "Politicians didn't build America, and they won't rebuild it, for their influence is but a passing phase."

He noted a swing in sentiment against many present policies of the Washington administration. "If we are patient," he added, "we will see the time when men like Girdler are recognized as the true heroes of America."

Mr. Girdler, who had come to the meeting from Washington, referred to a statement by Senator Robert F. Wagner, New York, author of the national labor relations act, at hearings in the capital earlier in the day, that "emasculation of the act would be a national calamity."

"I don't know just what he meant by 'emasculation,'" Mr. Girdler said, "but if you have to make a bad law into a good law by "emasculating' it, then you had better 'emasculate' it.

"I ask you gentlemen of the Ohio society to see if you can't put forth a little bit of effort now during these hearings in Washington to have it amended into a good law for the benefit of all the people who work."

Editorial

Sticking Necks Out

■ AS a rule stockholders who do not receive dividends proportionate to their industrial investments suffer in silence, for they generally understand the factors which prevent many managements from making a fair profit. Therefore the sweeping character of a complaint by a stockholder at the recent annual meeting of United States Steel Corp. (STEEL of April 10, Page 32) partook of the unusual.

"Collective bargaining for stockholders as well as steelworkers." That was the slogan he sounded. Pointing out that owners of the property as represented by common stock have received only $1 in dividends during the past seven years, while at the same time huge taxes and other charges have been paid, he classed stockholders as "forgotten men and women."

He warned that unless a way is found for taking care of stockholders' interests "better and more often" there "will be no good jobs for you fellows and certainly no more capital made available for investment." In particular, he suggested that stockholders' views about various types of legislation affecting business and management be recorded at annual meetings.

Stockholder Pressure Is Wholesome Factor for Better Business

J. Newcomb Blackman, the stockholder who expressed these sentiments, is vice president of the American Federation of Investors. The question naturally arises: Is this the start of a wave of protest from stockholders in general over a condition in which those who furnish capital that enables industry to pay huge taxes to government and high unit wage rates to labor receive little consideration for this service?

It is to be hoped that this is the case. For in too many instances management is failing to develop a positive plan of action aimed at educating political officeholders and the general public as to the sort of encouragement to business that is absolutely necessary in order to have a return of real prosperity in this country.

In fact, management has a phrase to describe this attitude. Many executitves explain their failure to fight for business rights by saying that they do not wish to "stick out their necks."

More pressure from stockholders would be a wholesome thing for business because it would force management out of its present passive attitude, which is a combination of wishful thinking and, at the same time, a continued willingness to lead with the chin.

STEEL's recent survey (STEEL of April 3, Page 15) indicates that the typical, average American industrial company would expend $83,696 on plant improvements at this time were it not for government policies and political uncertainties that further becloud the outlook for profits on industrial investments.

Educational Program for Public And Legislators Is Prime Need

While a large share of the public now is arrayed against much of the government's "reform" measures of recent years, there still is not the faintest indication of any general understanding as to what is required to make business "go" in order that a job may be provided for everyone able and willing to work, and in order that the march of progress toward a higher standard of living for the average citizen may be resumed.

Management in the past has met and overcome many difficult problems. This new problem, of educating the public and political officeholders as to how more jobs can be provided, is distinctly one for industrial management. And executives who fail to meet the issue by refraining from "sticking their necks out" are in danger, eventually, of having no necks to stick out.

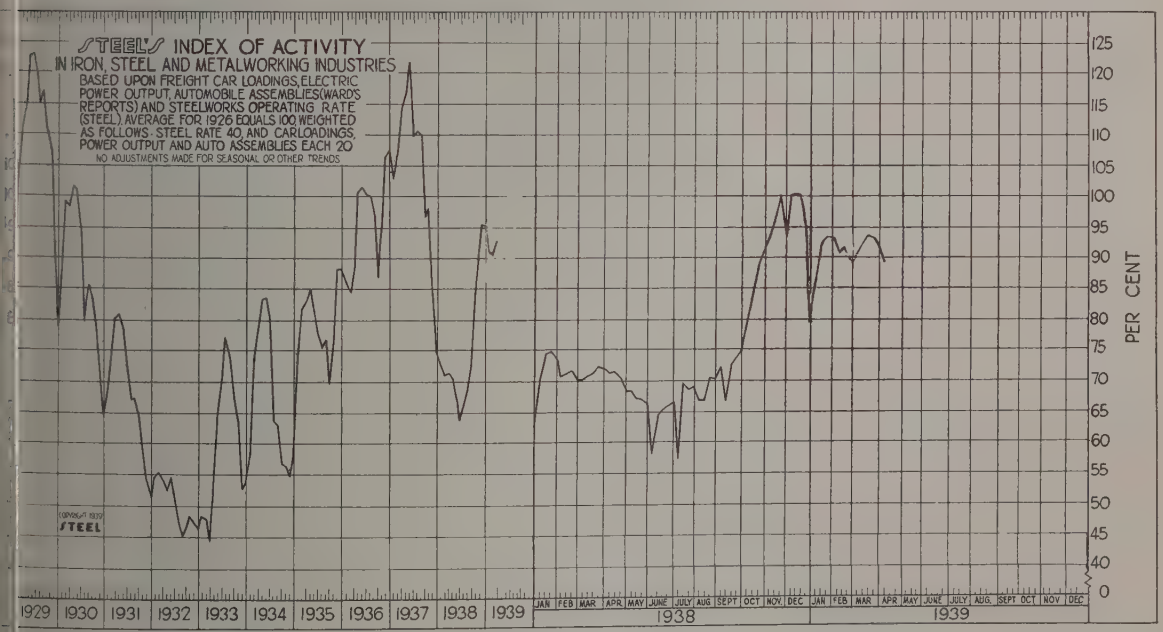
The BUSINESS TREND

look for Second Quarter
uded by War Scares

upturn in business activity formerly expected
lop in April has doubtless been postponed for some
Depressed business sentiment and the slump in
y prices, resulting from the tense European situ-
are working against an early reversal of the cur-
ownward tendency of most industrial indicators.
er, there are sound indications that pessimism has
verdone. The inventory situation and building
ction are both much better than they were a year
hile within the last two weeks retail car sales have
ed a firmer tone.
cting losses in three of the four business indicators from which it is composed, STEEL's index eased 2.2 points to 90.0 in the week ended April 8. This represents the third consecutive weekly decline, but the index still remains substantially above the 71.3 recorded in the comparable week last year. The current level of the index is 10.7 points below the 1938 peak of 100.7 recorded during the week ended Dec. 10.

The national steel rate has slipped one point for the third consecutive week, to 53.5 per cent in the week ended April 8. The current rate of steelmaking operations has reverted to the level of the first week in February. Recent downward tendency of the steel rate, after several weeks of stability, is significant in that it confirms earlier signs of a falling off in new business. To date this year steelworks operations have fluctuated within the narrow range of 51.5 and 56.5 per cent.

The lone business barometer composing STEEL's index to record a gain during the week ended April 8 was



STEEL'S index declined 2.2 points to 90.0 per cent in the week ended April 8:

ending	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
.....	91.9	74.4	106.7	89.3	73.8	58.1	48.6	56.2	72.1	91.8	104.2
.....	93.0	74.7	104.0	86.0	78.1	60.9	49.8	55.8	72.9	96.3	107.5
.....	92.9	73.8	99.6	86.5	79.5	62.3	50.8	56.2	72.9	97.4	109.8
.....	90.7	70.9	100.8	83.8	81.8	66.9	49.9	56.0	74.9	100.8	111.3
.....	92.1	71.2	101.9	85.9	82.7	70.7	48.7	55.5	75.4	100.9	111.7
.....	91.1	71.9	108.8	81.8	82.8	72.4	48.3	54.5	76.0	97.7	112.6
.....	89.3	70.3	112.8	83.4	80.5	75.5	46.0	55.1	75.8	99.7	109.2
.....	91.5	70.1	117.9	87.7	81.1	76.8	47.4	54.1	79.2	98.3	113.5
.....	92.7	70.8	112.7	89.7	82.0	78.6	43.4	54.8	80.6	97.5	114.8
.....	93.3	71.3	113.1	86.0	84.0	79.9	42.7	54.4	81.3	98.1	115.0
.....	93.2	72.4	114.0	91.2	84.0	79.7	44.6	53.5	80.6	99.6	115.0
.....	92.2	72.0	112.0	96.8	84.3	79.3	45.2	53.4	81.5	97.6	115.9
.....	90.0	71.3	112.8	99.6	83.4	79.6	49.1	52.6	80.9	102.3	119.9

automobile production. Assemblies in that week increased 1039 units to 87,019 and compare favorably with the 60,975 units produced in the corresponding week last year. Factory sales of automobiles in the United States and Canada aggregated 1,055,787 units in the first quarter, compared with 668,346 units a year ago, a gain of 56.3 per cent. Still further gains in factory sales have been reported for the first two weeks of April.

STEEL SHIPMENTS IMPROVE DURING MARCH

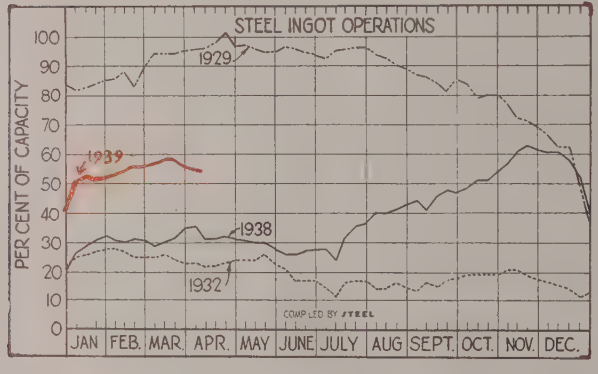
Shipments of finished steel products during March by the United States Steel Corp. recorded an encouraging gain to 767,910 tons. This compares with the February movement of 677,994 tons and represents an increase of 195,711 tons over the 572,199 tons shipped in March last year. For the first quarter shipments totaled 2,235,209 tons, against 1,565,244 tons in the same period last year. In the first three months of 1937, shipments aggregated 3,698,041 tons.

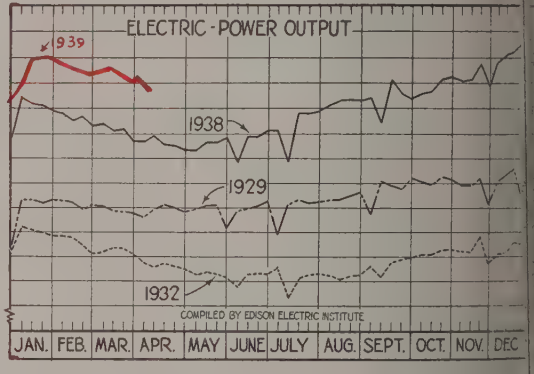
AVERAGE DAILY INGOT OUTPUT INCREASES

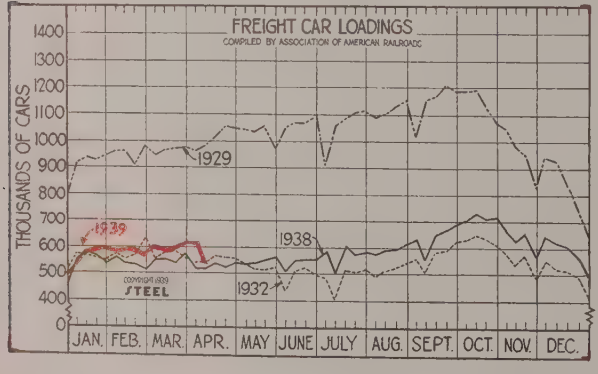
The daily average ingot production during March was 124,625 gross tons, based on the total output for the month of 3,364,877 gross tons reported by the American Iron and Steel institute. This compares with a daily average of 123,120 in February and 137,393 tons in 1938. Excluding November, 1938, the March daily average exceeded any month since October, 1937, of Ingot operations last month averaged 55.63 per cent compared with 54.10 in February and 33.85 in March. First quarter operations averaged 54.14 per cent compared with 55.77 per cent in the fourth quarter and per cent in the initial quarter last year. For three months of 1937 the national steel rate was 85.23 per cent.

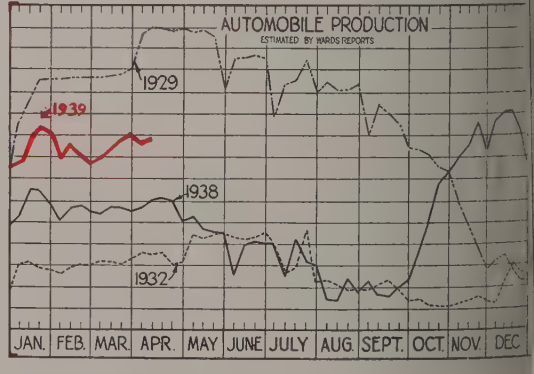
MARCH CAR AWARDS OFF SHARPLY

Domestic freight car awards during March total cars, substantially less than the 2259 cars ordered February but compares favorably with the January total of only three cars placed. The first quarter awards aggregated 3062, against 814 in the corresponding period of 1938, 30,933 in the same period and 9582 in the first three months of 1936. Dept. of commerce reports shipments of rail locomotives during February totaled 17 against 23 in January and February of last year. Unfilled orders for locomotives March 1 were 116 against 91 at the end of January, 159 on March 1, 1938. Freight cars on order March totaled 6788, compared with 6637 Feb. 1.

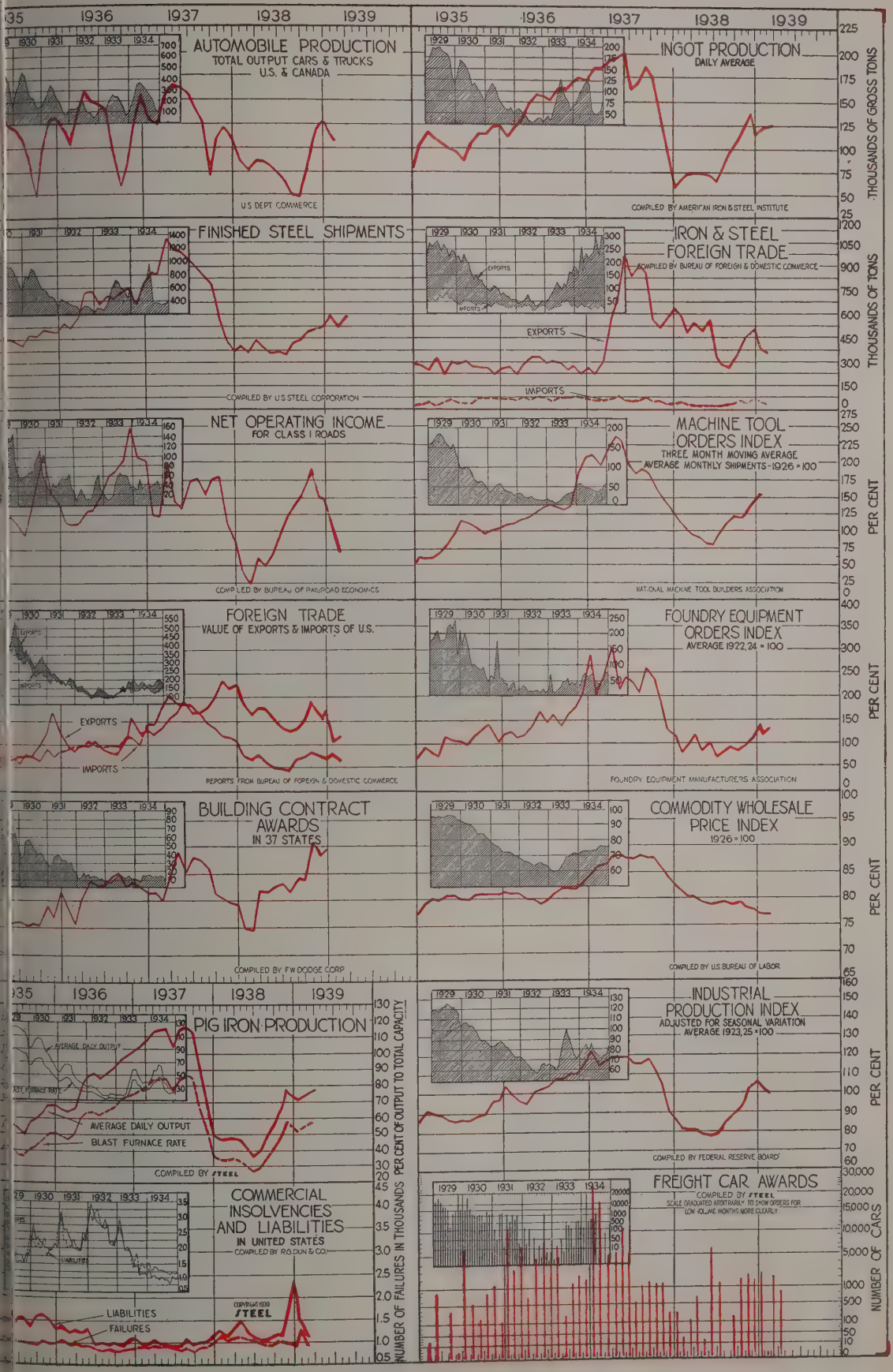








Week ending	Steelworks Operating Rate Per Cent			Electric Power Output Million KWH			Freight Car Loadings Thousands of Cars			Weekly Auto Output		
	1938	1932	1929	1938	1932	1929	1938	1932	1929	1938	1932
Dec. 31	40.0	13.0	38.5	2,120	1,415	1,638	500	407	638	75,215	25,598
	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932
Jan. 7	51.5	26.0	25.0	84.0	2,169	2,139	1,619	1,542	531	552	573	799	76,685	54,084	30,755
Jan. 14	52.0	29.0	26.0	82.0	2,269	2,115	1,602	1,734	587	580	572	914	86,925	65,735	31,416
Jan. 21	51.5	30.5	27.0	83.0	2,289	2,108	1,598	1,737	590	570	562	932	90,205	65,418	29,365
Jan. 28	51.5	33.0	28.5	84.0	2,292	2,098	1,588	1,717	594	553	560	926	89,200	59,365	28,950
Feb. 4	53.0	31.0	28.5	85.0	2,287	2,082	1,588	1,728	577	564	575	947	79,410	51,443	27,110
Feb. 11	54.0	30.0	27.0	86.0	2,268	2,052	1,578	1,726	580	543	562	956	84,500	57,810	29,320
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100	30,410
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,150
Mar. 4	56 0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	78,705	54,440	31,390
Mar. 11	56 5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438	31,110
Mar. 18	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558	30,590
Mar. 25	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800	32,892
Apr. 1	54.5	36.0	23.0	95.0	1,210	1,979	1,480	1,680	604	523	545	967	85,980	57,500	35,756
Apr. 8	53.5	32.0	22.0	95.5	2,173	1,990	1,465	1,663	535	522	545	956	87,019	60,975	35,390


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS
U.S. & CANADA
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
THOUSANDS OF TONS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
EXPORTS
IMPORTS
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
1935 1936 1937 1938 1939
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
PER CENT OF OUTPUT TO TOTAL CAPACITY
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
NUMBER OF FAILURES IN THOUSANDS
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

Making Inexpensive Dies

By electroforming a copper alloy or iron shell over a suitable model and backing up this shell with bronze, brass or iron, dies for die casting may be produced economically. Process is outlined here

By J. F. RIELEY

■ BY A MODIFICATION of an established process used for reproduction and electrotyping, it is now possible to build dies for die castings and molds for plastic materials. This process renders possible economical production of dies and molds; in fact, after a model of the desired part has been obtained, the cost of die or mold production will depend upon the size and weight of die blocks rather than upon the nature of the cavity. Process consists in electroforming a shell over a suitable model and backing such shell up with bronze, brass or iron.

It is necessary to obtain a model having a finish at least equal to the finish required on the desired part. As to size, such model may be either the true size of the required part or sufficiently larger to allow for solidification shrinkage. Such model may be almost any material: Metal, plaster, wood, or a high melting point wax.

Duplication of present dies or molds may be accomplished directly from castings produced in existing dies or moldings in existing molds.

After such model has been obtained, if of a material which is a nonconductor of electricity, it is necessary to render the surface conductive. This may be accomplished by rubbing it with a very fine graphite such as that used in the production of electrotypes, or the surface may be dusted with a very fine lacquer. If the model is of metal or other electrically conductive material, it will have to be treated by some process which will render it separable from finished die or molds. This treatment ma in graphiting as above, al drop of oil may be nec make the graphite adhere; ing of silver iodide may be by plating the metallic mo silver, after which the sil is treated with ordinary t tincture of iodine. This t produces a coating of silv which is a good electrical c but one which is readily s from the metallic model.

The treated model then is upon a graphite plate, bra or other convenient mediu will serve to make a part

After these preparatio been made, the treated and model is suspended in an plating bath and plated to t ness which will provide strong enough to withstand and the heat requisite to ba

Such shells may be any o materials depending entire the properties desired. C brass shells are useful wh

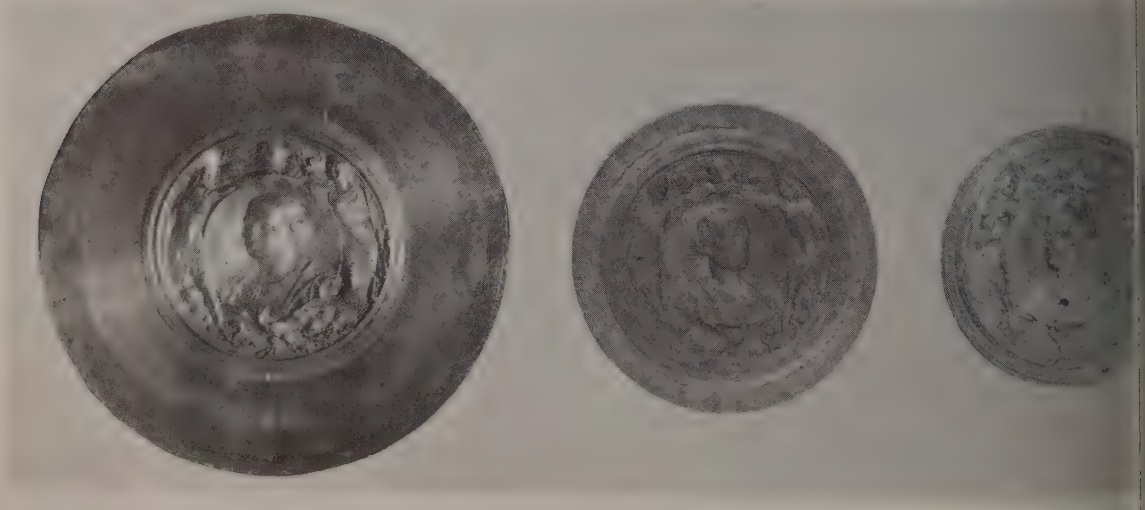


Fig. 1 (Left)—Copper shell model of Columbian exposition medal, mounted in a graphite plate, ready for plating operation. Fig. 2 (Center)—Completed die block with beryllium copper backing. Fig. 3 (Right)—Zinc alloy die casting made with die shown in Fig. 2

ain is encountered—such as roduction of lead castings; ay be used when zinc cast- e desired, or other alloy e occasionally useful. How- on probably presents the most useful shell. Electro- n may be case-hardened, o to produce, requires no reatment of surface, such as m plating, which is desir- the other shells mentioned. ier to make a shell which held firmly in the backing it has been found con- to force treeing of the back

DETAILS OF EXPERIMENT—IRON DEPOSITION SOLUTION

Constituent	Original Formula	Additions
Ferrous Chloride	40 oz./gal.	None
Calcium Chloride	45 oz./gal.	None

Volume: 5 gals. approx. Temp.—180 deg. Fahr.

Current		Cathode		Anode	
Amperes	20	Number	1	Number	2
Amp. per sq. in.	0.513	Material	Copper	Material	Swedish iron
Anode	0.513	Size	7 in. diam.	Size	3 x 6½ x ½ in.
Cathode	0.513	Approx. area	39 sq. in.	Approx. area	39 sq. in.
Time	31 hr.	Preparation	Graphite	Composition	Iron
Voltage	Board, 4.5 Tank, 3.8			Dist. from Cathode	8 in.

ding Material a Problem

roblem of what material to backing the electroformed very important. The prop- copper alloys, such as high nt of heat conductivity, uch a backing material de- for some purposes; although ficients of expansion of the base alloys are quite a bit han the iron of the shell. In ases, this difference in ex- may cause a breakdown of particularly where a con- recurring cycle of heating ling is found—such as in the water-cooled die-casting dies. king materials may be used, a more homogeneous block in which the differences in on are negligible.

acking material may be ap- several different ways: By or welding until such weld up to the desired thickness, uring molten metal directly e back of the shell. However, the best and easiest ways y backing material is by pray. Application of metal spraying process has little y to warp the electroformed requires no pre-heating of hell. It presents the most means of applying iron . Of course, the metal spray will not have the compressive strength of the welded, brazed or poured backing materials, so it may be necessary to resort to these means in some instances. Beryllium copper is an advantageous alloy to use in some cases.

Fig. 6—In the plating operation this treeing was forced by use of low amperage in order to facilitate holding shell in the backing material

After application of backing material, block is machined to size in the usual manner and, in the case of die-casting dies or injection molds, may be inserted into a cast iron or semisteel nest. In the more usual type of molding, blocks may be bolted directly upon the heater plate.

Of course, as is usual in almost any type of die, hardening is desirable. Hardening of iron shells may be done in the usual way if such shells are backed up by sprayed or welded steel. If other materials are used, or if it is desired to harden before backing, special means of hardening may be necessary.

Tests Process

In an experiment conducted by the writer to determine practicability of the method of die forming described above, model chosen was a copper shell in low relief copied from a Columbian exposition medal, Fig. 1. This shell was mounted in a graphite plate, as shown in Fig. 4. Back of the graphite block was coated with lacquer to stop plating of iron on this surface. Face of the copper shell was rubbed vigorously with colloidal graphite, and after attaching a suitable conductor to the graphite block, it was ready for the iron plating solution.

After plating was completed, shell was inverted and cavity was filled by placing in it the copper model from which it was made. Shell and model then were placed in sand, the copper model down. A steel ring about 7 inches in diameter was placed around the whole, and 2.25 per cent beryllium copper was poured on. This backing adhered closely upon the trees, which had been forced by use of low amperage. After machining, the finished block appeared as shown in Fig. 2, and diagrammatically in Fig. 5.

This block of composite structure was inserted in a steel die block forming the cover half of a die. Ejector half was made in the usual manner. Die castings formed with this finished die were made from a zinc alloy and appeared as shown in Fig. 3.

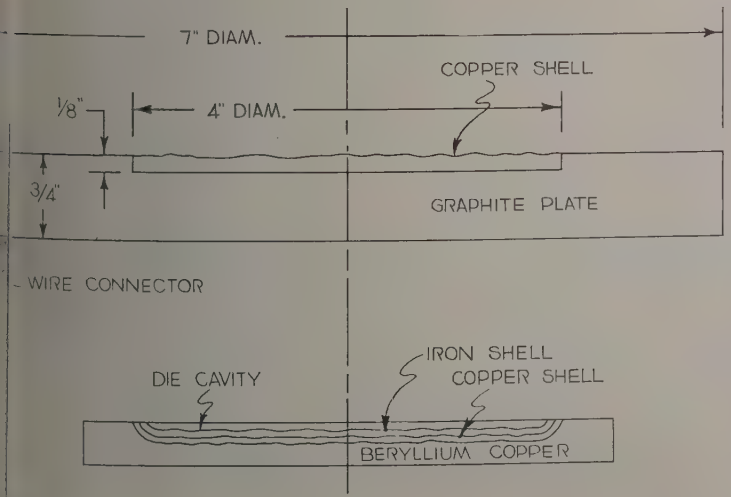


Fig. 4 (Upper)—Diagram showing how copper shell model was mounted in graphite plate. Fig. 5 (Lower)—Cross section of completed die block

Foundry Iron

Relative advantages of Southern ores are discussed from the standpoint of their suitability for use in the gray iron foundry. Need for mixing ladles or some means to assure uniformity of cast is pointed out

By J. P. DOVEL
James P. Dovel & Co. Inc.
Birmingham, Ala.

■ FREQUENTLY the question is asked, "Why is iron, made from brown ore, better than iron made from red ore?"

A more logical question would be, "Why does iron made from brown ore given better results in the gray iron foundry than iron made from red ore?" Of course, there is no difference whatever as far as the iron outside of the ore is concerned. The difference in results obtained from iron made from brown ore and that from red ore is due entirely to the alloying elements present, manganese and phosphorus.

Brown ores from southern Appalachian fields carry considerable manganese, some are rather high in phosphorus, and some contain less phosphorus than the principal red ore deposits in the Birmingham district. One of the principal brown ore deposits in the vicinity of Russellville, Ala., produces iron of about 0.60 per cent manganese and 1.00 to 1.30 per cent phosphorus, while red ore usually produces iron of 0.22 per cent manganese and about 0.87 per cent phosphorus.

A direct effect of either of these alloying elements is to weaken the iron to some extent and to produce a tendency toward brittleness and increased shrinkage in gray iron castings.

Manganese Affects Ferrite

The indirect effect of manganese is its action on the ferrite in the molten iron. Its great affinity for oxygen sets up a reaction between the manganese and the oxygen in the ferrite, resulting in manganese oxide. Impurities in the ferrite, such as silicon and alumina, also are liberated and float to the top producing what foundry men call "kish." Apparently, all iron coming from the blast furnace carries some ferrite (partly reduced ore). This ferrite is immediately attacked in the runner or ladle by the manganese, liberating the impurities together with the manganese oxide which floats to the top.

This reaction is very active in the runner, owing to the iron being spread out in a thin sheet. After these impurities have been floated out, they cannot cause any serious trouble in the cupola. As the cupola is not a deoxidizing apparatus, they will float on a cupola ladle and can be skimmed off. Some practical foundrymen introduce ferromanganese in the ladle in order to get this reaction.

Time Element Important

This method requires that the iron remain in the ladle some little time. If the iron is to be used in castings with extremely thin sections, this time element may be objectionable as iron for such work must be poured quite hot. This is probably one reason why some foundrymen prefer sand-cast iron for thin section work. Also sand-cast iron does not break down in the cupola at as low a temperature as machine-cast iron. The casting of iron in sand has almost become a lost art, as nearly all furnace operators have gone to machine casting. This was first brought about by the steel producers as a matter of economy and convenience and because sand was objectionable in the steel furnace. Later developments have made it possible to cast cheaper in the sand.

Another feature that should be considered is that iron coming from the blast furnace may be of two or three different grades in the same cast. An extensive investigation along this line showed that from 100 casts a little more than 30 per cent included two grades to the cast and 10 per cent showed three grades to the cast, an important

Samples taken of the analyzed as one sample dic correct grades as one e cast could be No. 2, soft other end could be No. 3 while the analysis would sh foundry, for the whole shipping, one customer No. 2, soft iron, while would get No. 3, foundry his No. 2, foundry, order. per probably would have an adjustment to the cust received the No. 3, foundry. customers would be dissat course, a mixture of No and No. 3, foundry, does duce a No. 2, foundry, Both types are of closer g a high graphitic carbon No. ry, and would not carry scrap in the melt.

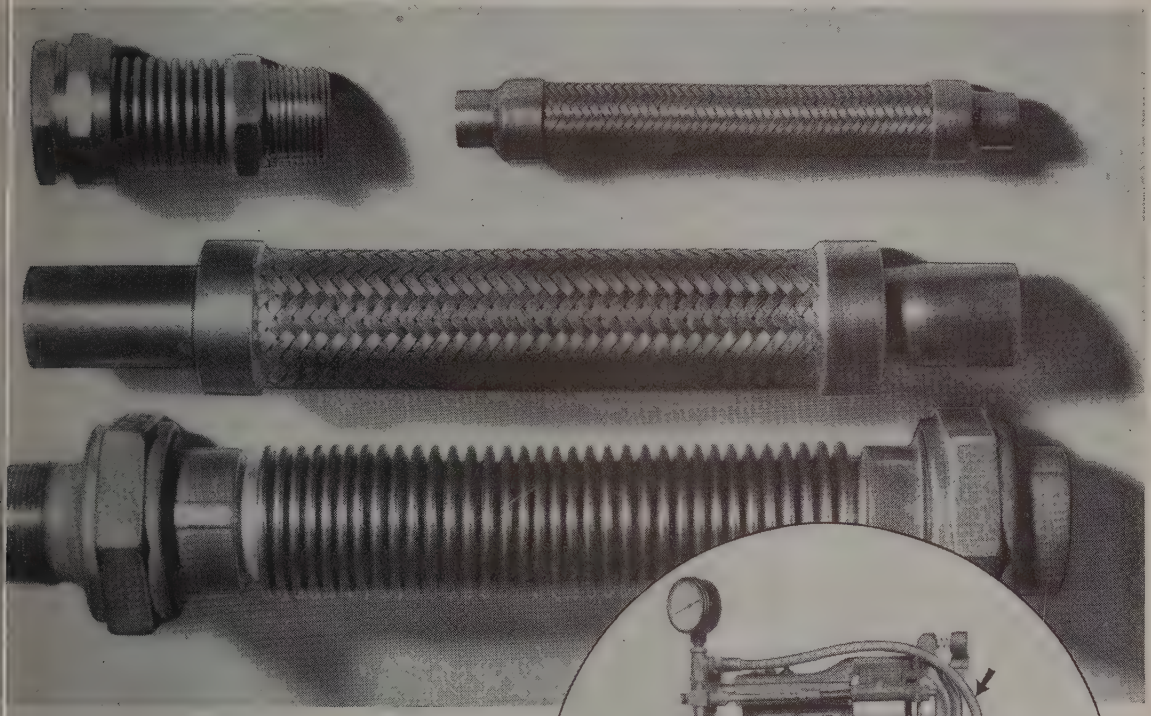
With the fact established different grades of iron in per cent of casts coming blast furnace do not th alloy in the crucible of the it leaves a doubt as to wh iron cast directly into the mix thoroughly and produ form grade throughout t cast. Complaints from b ducers and users about iro ing uniform confirm these

Phosphorus Helps Mold

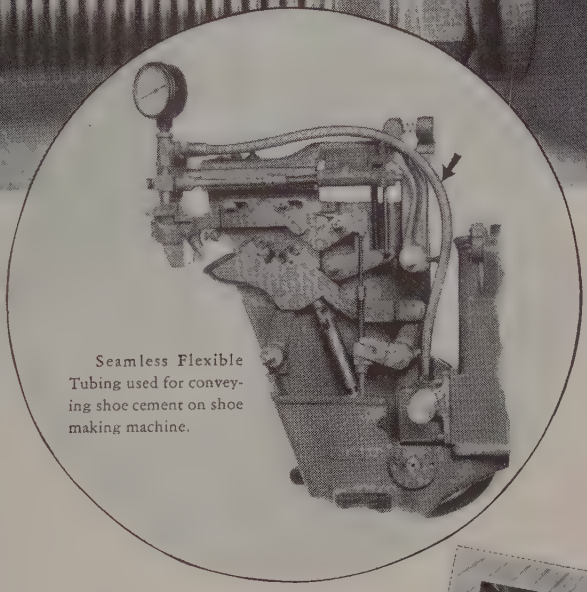
As to phosphorus in p there is considerable diffe opinion by foundrymen a merit or demerits. It is a however, that iron contai to 1.2 per cent phosphoru better than iron with a low phorus content. When cast, into thinner sections than phosphorus iron and will lower silicon content in t The lower silicon will more set any weakness due to of phosphorus as comparat with lower phosphorus iro shown.

eamless *Flexible* Connectors

...THE SAFETY LINK BETWEEN TWO MOVING PARTS



...blies of American Seamless Flexible Metal Tubing with various types f... fittings used as leak-proof flexible connectors for taking up vibration, misalignment, etc.



Seamless Flexible Tubing used for conveying shoe cement on shoe making machine.

THE installation of American Seamless Flexible Metal Tubing is cheap insurance against the need for future ...icing. Wherever you need a flexible connector or con... or . . . for misaligned or moving parts, for absorbing ...ation . . . the one best answer lies in the use of Amer... Seamless Flexible Metal Tubing.

...here are no joints, welds, laps, seams or packing where ...s can occur. For the conveyance of air, water, oil, steam ...uel, this flexible tubing has no superior. That's why ...e and more designers of machinery and maintenance ...ineers are specifying "American Seamless."

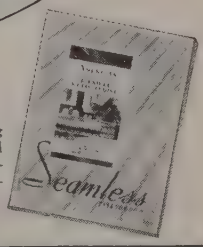
...rite us about your connector problems. Our engineering ...artment has a wealth of information on the use of ...nerican Seamless" on all types of ...hinery. Consultation of this depart...nt entails no obligation.

89245

ANACONDA
from mine to consumer

FREE REFERENCE HANDBOOK ON SEAMLESS FLEXIBLE METAL TUBING

The most dependable *flexible* connector for conveying liquids or gases under high pressures...made from special *seamless* tubes of any workable metal. Handbook contains descriptions, illustrations and valuable engineering data. Write for Bulletin SS-3.



American Metal Hose

AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Conn. • Subsidiary of Anaconda Copper Mining Company

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

OPEN HEARTH

American Institute of Mining and Metallurgical Engineers

COMMITTEE

The National Open-Hearth Committee is very happy to invite anyone who is associated with the iron and steel industry to attend the annual conference which will be held on April 26, 27 and 28 in the Cleveland Hotel, Cleveland, O.

These meetings have grown in interest and importance from the day when a score of steel men met in the Wm. Penn Hotel, Pittsburgh, in 1925 until four hundred attended the 1938 conference in Buffalo, N. Y. Now practically every steel plant in the United States sends representatives.

The Minutes of the conference mirror the development of the art and the industry from year to year. They are in great demand by steel managers in foreign lands.

Many problems dealing with personnel, equipment, operations, refractories, slag control and metallurgical problems will be discussed at this conference.

Come and take an active part in our deliberations.

Our motto is: "Give the other fellow the benefit of your experience."

Sincerely yours,
L. F. Reinartz,
Chairman,
Open-Hearth Committee
A. I. M. E.

OPEN HEARTH
Meetin
Apri

WHEN the Open Hearth committee of the American Institute of Mining and Metallurgical Engineers held their first meeting in Pittsburgh, April 15 and 16, 1925, at the suggestion of J. V. W. Reynders, the idea of organization was received favorably by the executives of various steel companies.

Purpose of the committee was to make detailed studies of the steelmaking process from the standpoint of production, cost and quality. At the outset three subcommittees were appointed. That covering furnace design had the following members: Kent Harrison, Donner Steel Co., chairman; R. J. Cain, Bourne-Fuller Steel Co.; Frank King, Weirton Steel Co.; Kenneth McCutcheon, American Rolling Mill Co.; and J. R. Mountain, Trumbull Steel Co.

Members of the Practice and Yield committee included G. D. Tranter, American Rolling Co., chairman; George Kitto, Pittsburgh Steel Co.; A. W. Smith, Youngstown Sheet & Tube Co.; B. P. Wheeler, Wheeling Steel Corp.; R. L. Leventry, Republic Iron & Steel Co.; and H. B. Hubbard, Inland Steel Co.

The Refractories committee included the following: G. A. Bole, bureau of mines, chairman; A. R. Maxwell Jr., Pittsburgh Steel Co.; N. E. McCallum, Phoenix Iron Co.; and M. C. Shannon, Gulf States Steel Co.

The gatherings always have been informal. Instead of papers being delivered before the meetin tails of open-hearth practice plained and compared by operators impromptu from t in the nature of a round ta cussion. Any operating man audience is entitled, and is w to discuss subjects.

Since its inception, the Hearth committee has be clearing house for ideas an gestions in regard to inc tonnage. Open-hearth super ents, many weeks before the meeting is held, are asked to questions; these later appea program for discussion at th ous sessions. The meetings have been marked with an phere of frankness. Views pressed as though the men sitting opposite each other open hearth shop.

Since 1925, conferences Open Hearth committee hav held in Pittsburgh, Chicago, land, Buffalo, Detroit, Young O., Cincinnati and Birmin Ala., and have totaled 21. Fro to 1932, the meetings were h the spring and fall, but sinc the gatherings have been spring only. Attendance h creased from 26 at the first ing in Pittsburgh to 357 a Buffalo meeting held in 1938.

Clyde E. Williams

L. F. Reinartz

Francis H. Crockard

T FURNACE
veland
d 28

ORY of the Blast Furnace
Materials committee of the
n Institute of Mining and
gical Engineers begins with
eon meeting, May 21, 1931,
Engineers club, New York,
ol. F. B. Richards first pre-
he plan to a group of dele-
presenting Iron & Steel di-
ron Ore committee, Mining
committee (all of A.I.M.E.),
States Blast Furnace &
en association, Chicago blast
and Coke Oven association
former Southern Ohio Pig
Coke association.

s resolved that a committee
he Blast Furnace and Raw
s committee be appointed to
the governing body for the
urnace and Raw Materials
ces; that this committee re-
he present Blast Furnace,
en and Iron Ore committees
ron and Steel division; that
nferences be held semiannu-
e conference each year being
New York at the time of
ual meeting in February,
ther being held in the Fall
the Chicago, Pittsburgh or
d district; that these con-
be held for the purpose of
ng technological problems
d with the mining, prepara-
d beneficiation of raw ma-

Iron and Steel Division

American Institute of Mining and Metallurgical Engineers

Committee on Blast Furnace and Raw Materials

A most cordial invitation is extended to all men interested in making, using and studying pig iron, and to those engaged in the mining and processing of the raw materials required in the production of pig iron, to come to Cleveland on April 26 and 27 to attend all technical and social sessions.. It is not necessary to be a member of the American Institute of Mining and Metallurgical Engineers to be admitted nor is there any registration fee for the blast furnace meeting.

The two sessions on Wednesday include papers on practical operations in this country and in South Africa. There will be some theoretical papers included and it is likely that the floor discussions will bring out some interesting facts and theories.

The joint session with the open-hearth men on Thursday morning is sure to be of great value to steel men as well as to blast furnace men. It will deal with such important matters as best temperature of hot metal for open-hearth practice, etc.

You are certain to hear much of interest.

Sincerely,

Ralph H. Sweetser,

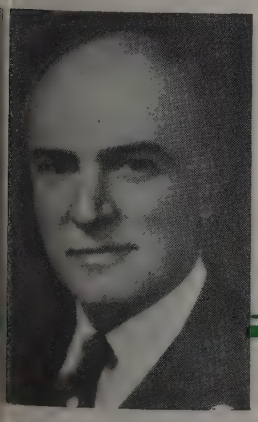
Chairman,
Blast Furnace and Raw Materials
Committee of A. I. M. E.

terials entering into the blast furnace, and with blast furnace and coke oven practice; that such conferences be open to all those interested.

Col. F. B. Richards, the first chairman served until 1935, when Ralph H. Sweetser, the present chairman, was appointed by the executive committee of the Iron and Steel division. The secretaries have been, successively, Clyde E. Williams, Ralph H. Sweetser and Francis H. Crockard, who are elected by the members of the committee at the April meetings, as are the two vice chairmen.

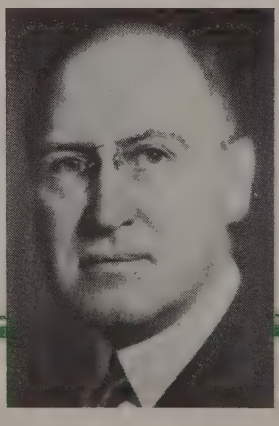
The committee now has an international membership, with the aim of having it as the clearing house for the best blast furnace practice all over the world. This committee supplements the work and meetings of the Pittsburgh and Chicago Blast Furnace and Coke Oven associations. All three groups work together.

At the April meeting in Birmingham, held at the same time as the Annual Open Hearth conference, April 1, 1937, a joint meeting of the Blast Furnace and Open Hearth committees was held with such good results that the second joint session was held in Buffalo last April. The program for the third such meeting to be held in Cleveland, has many important items of mutual interest to the iron men and the steel men of the entire country.



W. A. Haven

Ralph H. Sweetser



A. J. Boynton

INGOT YIEL
INCREASE
UP TO 3
BY LAPIX

★ WHAT LAPIX IS

First introduced to American steel mills early in 1938, was discussed in detail at the Open Hearth Meeting last spr steel men who had been testing it.

Lapix is a finely powdered, amorphous insulating material is applied to tops of ingot heads immediately after pouring.

It is a mixture of several ingredients including silicates, to with a form of carbon compound which cannot be picked up by hence no recarburization. It does not smoke, fume or give off

WHAT LAPIX DOES

★ A [illegible] INSULATING MATERIAL TO REDUCE TOP DISCARDS

It spreads over the top of the exposed metal, forming an in ing blanket. This keeps the metal molten for a sufficient time to p gases to escape and segregates to within a narrow range und sinkhead. There is no bridging or crust formation. Lapix t the surface of the metal down into the mould as normal contra occurs, thus retaining the heat.

Now in use in a number of the largest mills, Lapix has defi reduced top discards, also porosity and secondary pipe where tendencies occur.

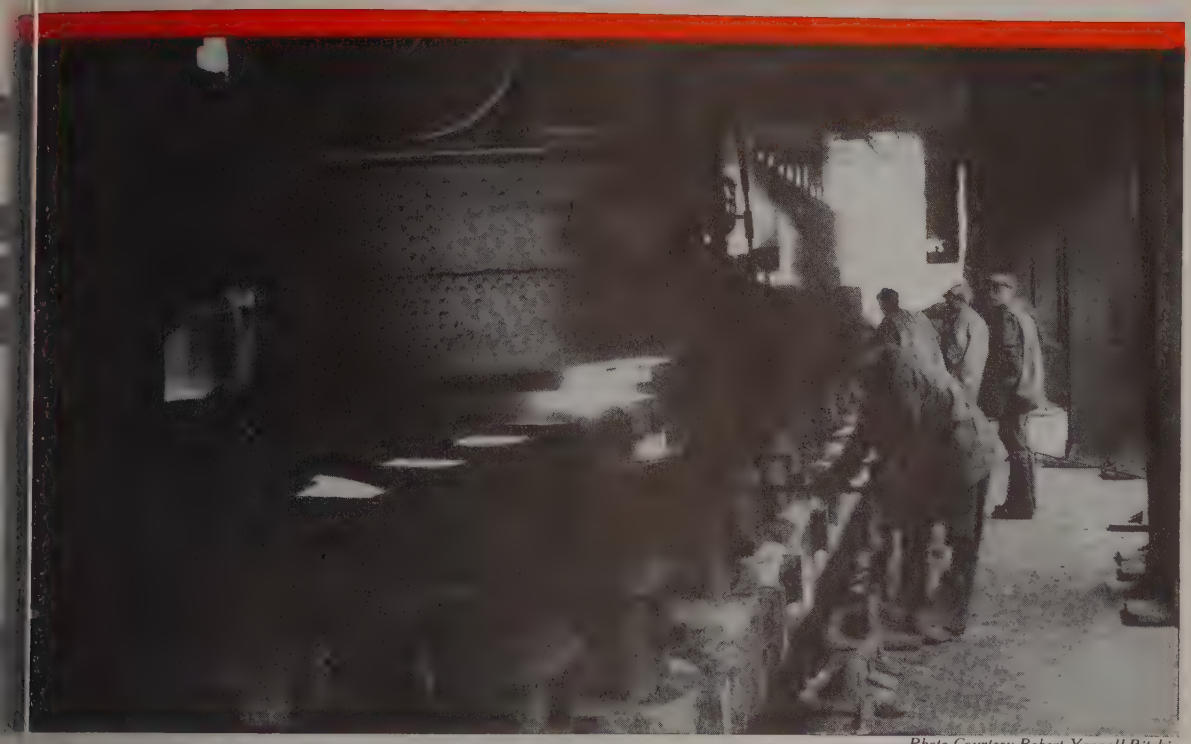


Photo Courtesy Robert Yarnall Ritchie

★POROSITY and SECONDARY PIPE DEFINITELY REDUCED

WHAT LAPIX SAVES

By minimizing the metal required in the hot top of killed steel ingots, Lapix has a positive record of increasing ingot yield from 1 to as much as 3%. Only 1½ pounds are needed per ton of ingot, therefore adequate protection is afforded at an average cost of six cents per ton.

WHO SELLS LAPIX

E. F. Houghton & Co. (established 1865) manufactures this material in its own plants. Lapix is 100% American, the sources of supply for the raw materials being right here in the United States. This company makes a variety of special industrial products as listed below, and maintains sales and service offices in all principal cities. It has established a Steel Mill Division with headquarters in Pittsburgh.

Write to the address below for results of production runs where Lapix has been used profitably.

Houghton Products for Steel Mills

METAL CLEANERS, QUENCHING OILS, HEAT TREATING SALTS, PICKLING INHIBITORS, CUTTING OILS, RUST PREVENTIVES, SPECIAL STEEL MILL LUBRICANTS, VIM LEATHER PACKINGS, VIM TRED LEATHER BELTING.

Steel Mill Division

E. F. HOUGHTON & CO.

BESSEMER BUILDING, PITTSBURGH, PA.

Factories — Philadelphia :: Chicago :: Detroit

Sales offices in all principal cities

PROGRAM

Blast Furnace and Raw Materials Committee and Open Hearth Committee of the A. I. M. E.

■ THOSE attending the committee sessions will find a trip through the world's largest continuous strip mill planned as part of the program. Visitors also will find many other interesting points in Cleveland. A major iron and steel producing center, Cleveland is located at the crossroads of commerce. A fleet of more than 300 freighters brings iron ore to the 15 blast furnaces in the Cleveland district.

In steelmaking capacity, Cleveland's 5,712,000 tons annually is about 8.2 per cent of the country's total. In this district also are 803 by-product coke ovens, 71 basic open-hearth furnaces, two bessemer converters and 10 electric furnaces. These are operated by Republic Steel Corp., American Steel & Wire Co., Otis Steel Co., all of Cleveland; and National Tube Co., Lorain, O.; Timken Steel & Tube Co., Canton, O.; and Empire Sheet & Tin Plate Co., Mansfield, O.

Five technical sessions will be held during the Open Hearth conference, and three sessions will be held by the Blast Furnace and Raw Material group.

WEDNESDAY, APRIL 26

9:00 A.M.—Registration—Open Hearth and Blast Furnace and Raw Materials Committee—Mezzanine Floor.

OPEN HEARTH

10:00 A.M.—Opening Address—L. F. Reinartz, General Chairman, National Open Hearth Committee, A. I. M. E.—Ball Room (Mezzanine Floor).

Industrial Relations

R. K. Clifford, Chairman

C. R. FonDersmith, Vice Chairman

The Settling of Grievances — Russell Chaffin, Director of Industrial Relations, Continental Steel Corp., Kokomo.

Safety in the Open Hearth—C. R. FonDersmith, Supt. Open Hearth, The American Rolling Mill Co., Middletown.

Subjects for Discussion

(a) Training and Practical Use of Metallurgical Observers in the Open Hearth.

(b) Training foremen and men in the Open Hearth Department to follow cost;—quality;—fuel;—repairs.

(c) What done to improve working conditions in the Open Hearth Department.

(d) Checking Open Hearth practice for quality.

BLAST FURNACE AND RAW MATERIALS

10:00 A.M.—Opening Address—Ralph H. Sweetser, Chairman, Blast Furnace and Raw Materials Committee, A. I. M. E.—Empire Room (Parlor Floor).

Solution Loss and Slag Volumes

H. A. Strain, Chairman

W. E. Brewster, Vice Chairman

Effects of Solution Loss Reactions Upon Blast Furnace Economy—P. V. Martin, Asst. Supt. Blast Furnaces, South Works, Carnegie-Illinois Steel Corp., Chicago.

Low Slag Volumes and Resulting Effects on Cost and Quality—G. E. Steudel, Division Supt. of Blast Furnaces, South Works, Carnegie-Illinois Steel Corp., Chicago.

12:15 P.M.—Welcoming Luncheon—Open Hearth and Blast Furnace and Raw Materials Committee—Red Room (Mezzanine Floor).

Addresses of Welcome

Harold Burton, Mayor of Cleveland, and D. B. Gillies, President, A. I. M. E.

OPEN HEARTH

2:00 P.M.—Open Hearth Refractories—Ball Room.

Gilbert Soler, Chairman

Harley C. Lee, Vice Chairman

Discussion of furnace bottoms.

a. Plastic chrome bottoms.
b. Use of various types of magnesite, such as Seawater, Thomasite, Austrian, Canadian, Washington, etc.
c. How to keep bottoms clean. How are old bottoms resurfaced? What materials are used?

Use of basic brick and other special materials in open hearth furnaces other than bottoms.

a. Bulkheads.
b. Back walls.
c. Roof.

Improvements in checker construction.

a. Special brick and special settings.
b. Multiple checkers.
c. Other designs.
d. Do checkers run hotter in insulated furnaces?

Refractories and tapholes.

a. Materials used.
b. Control practice.

Runners and ladles.

a. What progress is being made with basic materials?
b. Other materials and designs
c. Methods used for lining composite ladle lining (2 d types of brick—same ladle).

Ladle accessories: Sleeves, stoppe and nozzles.

a. Materials and designs in sleeve brick.
b. Materials and designs in stopper heads.
c. Materials and designs in nozzles.
d. Type of bond between the brick and mixtures used for well.
e. What special qualities are for a nozzle?

Hot tops and mold plugs.

a. Various types of hot tops
b. Relative advantages of per hot tops vs. clay hot tops. in ent types of steel in regard and quality.
c. Mold plugs.

What refractory specifications a essary for the open hearth oper order to obtain uniform and s tory refractory materials?

a. Bottom materials.
b. Basic and chrome brick, etc
c. Ladle brick and fire brick.
d. Silica brick.
e. Pit refractories: sleeve brick pers, nozzles, hot tops, mold p
f. Other refractory materials.

Needs for future development refractories industry in order crease the operative efficienc prove quality and lower overa in the open hearth.

BLAST FURNACE AND RA MATERIALS

2:00 P.M.—Operating Practice; Materials—Empire Room.

Horace Allen, Chairman

J. H. Slater, Vice Chairma

Blast Furnace Practice in South —J. A. L. Ortlepp, African Metals Johannesburg.

Low Temperature—Vacuum Meta cal Process—Alfred Musso, Cons. New York City.

Freight Costs of Iron Ore—H. M. Cons. Engr., Dover, N. J.

THURSDAY, APRIL 27

9:30 A.M.—Joint Session—Open H and Blast Furnace and Raw Ma Committees—Ball Room.

L. F. Reinartz, General Chairm

J. W. Kinnear, Jr., Co-chairman Open Hearth

A. J. Boynton, Co-chairman for Furnace

How Silico-Manganese improves Rimming Steel

WHEN silico-manganese is added to rimming steel shortly before tapping, a cleaner, better steel is produced. The inclusions formed have appreciably lower melting points and are of a modified type. Results indicate that this modified type of inclusion decreases the age-hardening tendency of rimming steel. In addition, this silico-manganese treatment permits a reduction in the use of other deoxidizers that lead to objectionable inclusions.

Ask to have one of our metallurgists call and explain more fully the advantages of silico-manganese for producing rimming steel. He will gladly help make your use of this and other "Electromet" ferro-alloys more profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

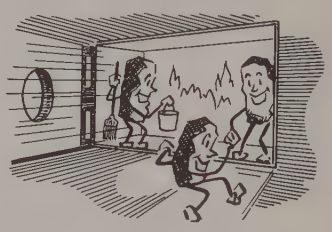
Items of Interest out other "Electromet" Ferro-Alloys

anadium Improves Steel Cast-gs — The addition of a small amount of anadium, usually not over 0.10 per cent, steel castings refines grain, materially ises yield-point strength without sacrific-g ductility, and greatly increases resist-ce to shock and fatigue. This is especially seful in engine and railroad car castings.

or Fine-Grained High-Chromium teels, Use High-Nitrogen Ferro-hrome—High-nitrogen ferrochrome adds trogen as well as chromium to high-romium steels. Nitrogen in small amounts reatly refines the grain size of these steels, reduces objectionable grain growth at high temperatures, and materially increases strength and toughness. Machinability and corrosion resistance are retained.

Columbium Eliminates Quenching of Welded Austenitic Stainless Steel Equipment — When columbium is added to the austenitic stainless steels, a stable carbide is formed which makes the steel immune to intergranular corrosion. Hence columbium-bearing stainless steel equipment welded with columbium-bearing welding rod does not have to be quenched from a temperature of 2,000 deg. F. to regain full corrosion resistance. This eliminates a costly and time-consuming fabricating step.

For Cleaner Steel, Make a Final Addition of Calcium-Manganese-Silicon—Calcium-manganese-silicon, used as a final alloy addition to steel, produces a cleaner, coarse-grained steel with deep-



hardening properties. Long commercial use of this combination alloy has proved its merits for this purpose. Calcium-manganese-silicon is also being successfully used to deoxidize all types of stainless steel, high-speed tool steels, and special steels subject to transverse testing.

Zirconium Inhibits Carbon Segregation — Zirconium added to killed steel in the ladle diminishes the variation in carbon content within the ingot. By thus inhibiting carbon segregation, zirconium makes grain structure and properties more uniform throughout the ingot.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service, S3-16."

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trademark of Electro Metallurgical Company.

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

Subjects for Discussion

What the open hearth requires from the blast furnaces.

Meeting the open hearth requirements.

What is the economical amount of open hearth slag that can be used in the blast furnace with respect to final ingot costs?

Have mixer type ladles justified their adoption—(1) where they have replaced small ladles; (2) for new installations?

To what extent may blown metal be substituted for steel scrap. What grade of iron is most economical for the production of blown metal?

Can the use of high silicon iron in the open hearth be justified by the extra amount of iron ore it will reduce?

Effect of Hot Metal Analysis and Casting Temperature on Open Hearth Quality—L. H. Nelson, Asst. Openhearth Supt., Republic Steel Corp., Buffalo, N. Y.

12:15 P. M.—Executive Committee, Open Hearth Committee—Luncheon Meeting—Room 1 (Mezzanine Floor).

12:15 P. M.—Blast Furnace and Raw Materials Committee—Luncheon Meeting—Room 5 (Mezzanine Floor).

INSPECTION TRIP

2:15 P. M.—Plant Visit—Open Hearth and Blast Furnace and Raw Materials Committees—Republic Steel Corporation, Cleveland Plant.

Chartered buses will leave the Hotel Cleveland at 2:15 P. M. for the Cleveland Plant of the Republic Steel Corporation. Members and delegates will be guided through the 98-inch continuous strip mill, the largest continuous mill in the world. Buses will leave the plant at 5:00 P. M. for the return trip to the hotel.

7:00 P. M.—Fellowship Dinner-Smoker—Ball Room.

Tickets $2.50 including Cocktail Party. Speaker: Harry Sain, Special Representative, Industrial Commission of Ohio—"Safety in the Steel Plant."

FRIDAY, APRIL 28

OPEN HEARTH

9:30 A. M.—Open Hearth Operations—Ball Room

A. P. Miller, Chairman
W. C. Kitto, Vice Chairman

Construction and operation of an experimental open hearth furnace—Harold K. Work, Manager of Research and Development, Jones and Laughlin Steel Corp.

Discussion of the construction and operation of the new furnace at the Pittsburgh Steel Co.

Instrumentation of the modern open hearth furnace.
(a) Draft control.
(b) Automatic fuel-air ratio control.
(c) Automatic reversal.
(d) Roof temperature control.

Special Pyrometers for bath temperature recordings.

Bottom Pouring Practice.
(a) Improvement of the ingot surface compared to top pouring and is it justified.
(b) Tundish or basket pouring practice.

Improvements in surface and interior quality of ingots.

Crowe Slag Pockets.
(a) Application.
(b) Advantages.

Use of Light Scrap.

OPEN HEARTH

2:00 P. M.—Open Hearth Metallurgy—Ball Room.

C. H. Herty, Jr., Chairman
E. G. Hill, Vice Chairman

I. KILLED STEEL

Does aluminum act on grain size as effectively when in a combined state, such as ferro-aluminum, as in regular stick or shot aluminum?

What other final deoxidizers other than aluminum are in use and what effect have they on grain size?

Does bottom patching material have any effect on grain size control?

On forging quality steels of large grain size, is it better to over-deoxidize in the furnace or be on the lean side in furnace deoxidation and finish deoxidation in the ladle?

The use of silico-manganese in forging and other steels.

How does mold design affect the quality of the ingot?

II. RIMMED STEEL

In making 0.07 to 0.09% C. rimming steel, will the reduction in carbon from the range 0.15 to 0.20% be best accomplished by oreing down the heat or bringing down the carbon with rods? Which method is preferable in regard to the oxidizing action in the steel itself?

What is the best FeO content of slag for rimming 0.20% carbon steel?

What percentage of automobile scrap can be used in making extra deep drawing steel sheets?

Do copper additions or residual copper make rimming low carbon steel sluggish?

What effect does high or low residual manganese have on rimming steel?

In making low carbon rimming steel, where is the best place for aluminum additions—ladle—molds?

Does a 2 to 3 inch rise in a rimming ingot due to the addition of aluminum in the mold, have the same effect on skin thickness as a rising heat from furnace conditions?

How does mold design affect the quality of the ingot?

What defects in finished sheets can be traced back to open hearth practice?

III. SLAG CONTROL

To what extent has FeO control in slags been applied to everyday production of steel?

Method of slag control:
(a) Run to a predetermined iron oxide.
(b) Slag cakes as guide.
(c) MnO determination.
(d) Method of raising or lowering FeO.
(e) Control of viscosity.
(f) Lime—SiO_2 ratio.

Does the use of FeO control result in being able to hold to close analysis limits. How close?

How much iron oxide can be removed from the steel through the decrease in the FeO content of the slag?

Cause and cure of foamy slags?

IV. EFFECT OF CHARGE

Analysis of scrap available for open hearth use. Synopsis of paper read at St. Louis Iron and Steel Scrap Convention.

Metallurgical advantages of deep vs. shallow baths. Ideal bath depth for forging steels. Why? Is more or less limestone used in a shallow hearth?

Frequently said "Low limestone charge is the cause for poor quality steel." Has anyone any positive evidence of this fact?

Which is more oxidizing—a cold pig metal or hot metal charge? Why?

Does cast iron in the charge a quality of steel? If limite per cent of total charge is per

Relative advantage and disad of high ore, low silicon iron basic open hearth furnace.

How can you be sure of a good slag?

V. GENERAL QUESTION

What advantages are attributed ing heats at the pouring pla
(a) Length of time.
(b) Kind of heat.
(c) Live or killed.
(d) If live steel, does a slag a heat is held?

Working heats:
(a) Maximum ore and pig ir tions, and time of additions
(b) Effect of spar.
(c) Use of sta-flux or burnt li
(d) Use of mill cinder or roll
(e) Carbon at melt.

In acid practice, what are the adv in using lime in the slag and the best percentage?

Influence of the following factor speed of carbon reaction in t hearth furnace:
(a) Fuel.
(b) Slag volume.
(c) Atmosphere.
(d) Temperature.
(e) Influence of bath agitatio
(f) Viscosity of slag.

Adjusting Business t New Federal Regulat

■ *Adjusting Your Business New Legislation*, by Researcl tute of America Inc., New 1065 pages, 7 x 9¼ inches; loo in fabrikoid five-ring binde plied by STEEL, Cleveland, for in Europe by Penton Publishi Ltd., Caxton House, Westm London, S. W. 1.

A double purpose is embod this publication, to avoid th alties of violation of the e chain of new laws regulatin ness and to turn to profitat count the favorable provisio each law.

The business man is show he can avoid possible troubl expense by knowing in ac what steps to take with reg each federal law regulating hours, labor standards, policies, prices, discounts and business practices.

Business control laws exp in this book are the wage and law, labor relations act, pure and drug act, federal trade co sion act, Robinson-Patman ac other regulatory measures. S recommendations are offered steps that should be taken to c with each law most conven and economically.

A chart of illegal business tices leads at once to the la plicable to the practice and th on which it is discussed. A s table presents state fair trad A comprehensive index cover entire subject matter, with fre cross references.

SS COST per Ton Steel Rolled

Every Phoenix Roll expresses this point: Specialization upon one product has a definite bearing upon the way in which that product performs. Good tonnage, excellent finish are built into every Phoenix Roll.

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- Phoenix Nickel Grain
- Phoenix K Chill and Grain
- Phoenix Special Rail Finishing
- Phoenixloy
- Pittsburgh Grade—working rolls for four high mills

PHOENIX STEELIRON ROLLS FOR WEAR, SURFACE AND STRENGTH

- Phoenix Metal
- Phoenix Metal Master
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PHOENIX STEEL ROLLS FOR STRENGTH

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- Piroco
- Phoenix Carbon Steel

HOENIX ROLLS

GH ROLLS DIVISION of BLAW-KNOX CO.—"Steel's Partner" · PITTSBURGH, PA.

Building the most dependa
Storage Battery starts w
high grade STEE

ROBERT YARNALL RICHIE

High Grade Steel from this Stock Room!

STARTING with high grade and finishing with high g steel is the process that goes to explain the ruggedness, long and dependability of Edison's S Alkaline Storage Battery.

Steel containers take steel plate gr assemblies. Steel positive tubes mounted on steel grids and steel n tive pockets likewise. Steel pole pi and steel connecting rods hold t steel grids rigidly in position.

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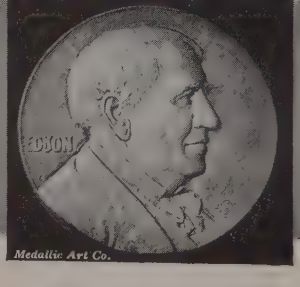
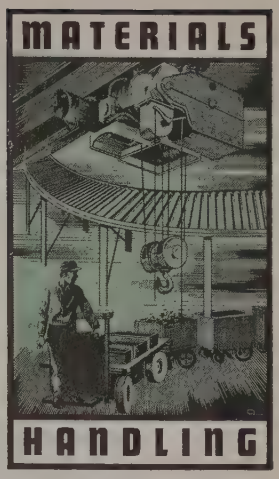
EDISON



STORAGE BATTER

DIVISION OF THOMAS A. EDISON, INC. WEST ORANGE, NEW JERSEY,



Electric Motor Cores

Five conveyors serve nine presses and two stacking machines, eliminating practically all handling operations in automatic setup which produces nearly 26,000 finished laminations per hour. Skeleton delivery ducts are pressure fed by presses

Part II

First part of this article described how standard 6-inch diameter disks were made. Second part, presented here, follows these disks through to finished rotor and stator laminations

IBLY the most interesting g operations in the Westing- mall-motor plant, Lima, O., connection with the auto- tup which blanks out stator r punchings and slots these

utomatic setup consists of atteries of presses with conveyors and belt con- rranged as indicated in lay- ram, Fig. 6. Flow of mate- ugh the various operations ated by the arrows. This tup is used to convert lam- for electric motor cores okie disks to the completely stator and rotor lamina- own in Fig. 8.

work consists principally of erations. In the first oper- e rotor disk is blanked out a doughnut shaped piece which is the stator lamination. In the second operation, the rotor disk receives punchings to afford ventilation through the core and to permit entrance of the shaft through the core. Also, slots are formed for the windings. In the third step, the stator lamination is notched to receive stator windings and punched to receive mounting bolts or studs.

In Fig. 6 it will be seen that these operations are handled in three batteries, each of these three batteries containing presses to handle all of the three steps previously mentioned. Output of completed rotor disks travels crosswise the center of the layout on a conveyor which carries the laminations to an automatic stacking machine shown in Fig. 11.

The finished stator core punchings travel crosswise the process lines on belt conveyor which takes them to another automatic stacking machine.

This setup is primarily of interest because of the high degree of mechanization employed. Cookie disks, formed by special equipment described in Part I of this article, are the raw material fed to this automatic setup. These disks are placed in the automatic feeding mechanism on the rotor blanking

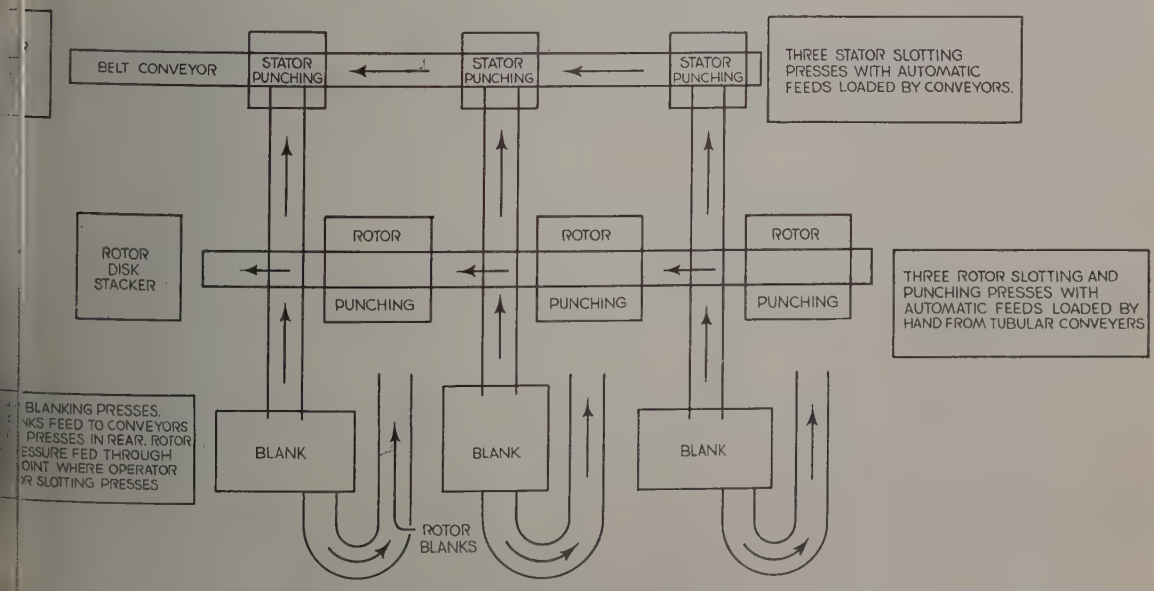
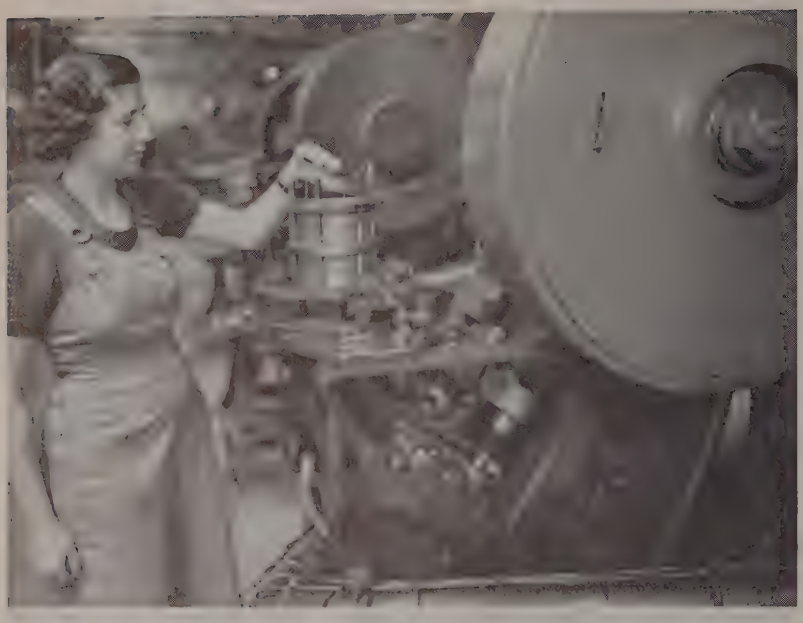


Fig. 6—Layout diagram showing the five conveyors with the nine presses and two stacking machines they serve



press at the front of eac
three process lines. Fig. 7
operator placing a quantity
in the feed mechanism a
these presses. All presses
clined to permit automatic

Rotor disks from this
press fall through the be
duct which leads to the r
ting press, the second m
each of the three process
This duct can be seen in t
part of Fig. 7 and also in
Rotor disks are taken fr
duct by an operator who l
automatic feeding mecha
the rotor slotting press a
in Fig. 10. A bank of rot
is maintained at this stage
mit continuous operation
changing of dies at the
press.

Flexible Wiring Syste

Fig. 10 also shows the flex
ing system employed at t
where a number of machin
corporated into a fabrica
processing lineup such as t
principal element of this wi
tem is a steel duct contair
power mains. This duct
lengthwise the room at reg
tervals. It permits conne
electric motors to a power
through flexible cables at a
in the floor area. This
greatly simplifies wiring bu
it extremely easy to shift
ment around to permit the r
vantageous arrangement.

Thus wiring and accessi
a power source is not a fact
considering changes in pla
out. In Fig. 10, two leng
square steel ducts are
mounted just below the str
steelwork forming the ceiling
the steel ducts are seen the
cables leading to the individ
tors on the presses.

From the blanking press
7, stator laminations slide
through the press onto a be
veyor shown in Fig. 9. T
veyor carries the doughnut
pieces to the stator slotting
and delivers the pieces to a
anism which automatically
the presses. After slottin
stator core laminations fal
28-inch belt conveyor carryin
crosswise the end of the pro
line as shown in Fig. 6 to a
matic stacking machine.

In a similar manner roto

**Fig. 7 (Top)—Here disks are load
the automatic feed of a rotor bl
press. Fig. 8. (Center)—Showin
from which the completed rot
stator sections, also shown, are
Fig. 9. (Bottom)—Stator blanks
the press in Fig. 7 fall through on
conveyor which automatically
them into a stator notching pr**

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e training of a big league ball player sually starts but never finishes . . . on ne sand lots. The years in between, ard years often, are spent in gaining the experience which a star performer must have.

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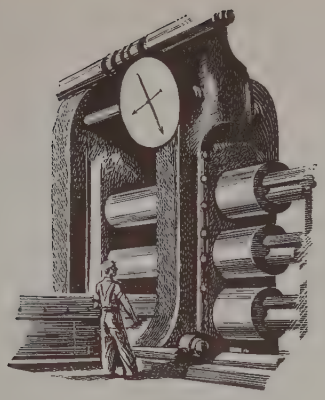
TIDE WATE
COMPLETE LINE OF TYCOL LUBRIC



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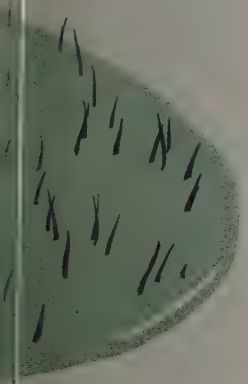

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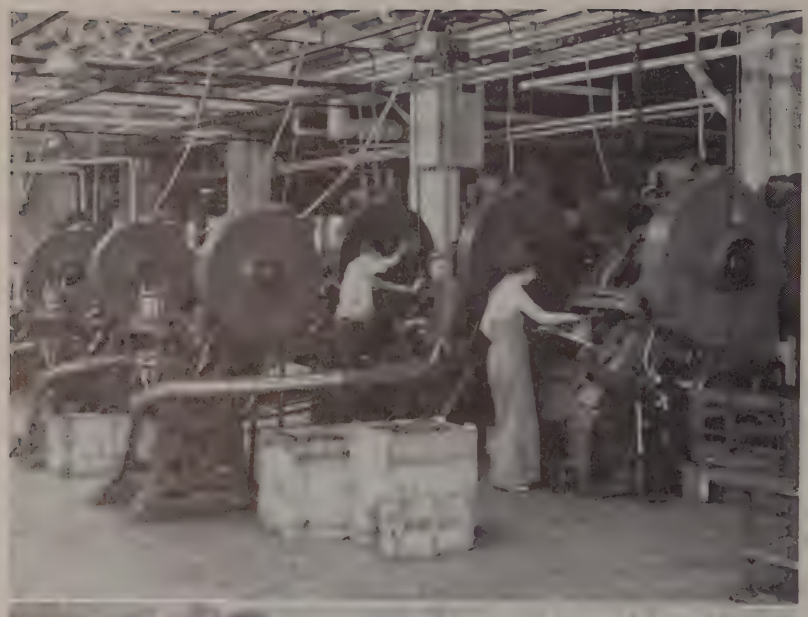


punchings, after being slot onto a belt conveyor whi moves crosswise the three ing lines to an automatic machine shown in Fig. 11. livery point of the stacking shown in Fig. 11 is conti joggled or vibrated by a mechanism to permit the w tion of the lamination falli the pack to expand it autom As the loading rack becomes operator removes the stacke and loads them on a rod fixtu as that seen at the right in

From this point the roto inations are placed in a m the rotor bars inserted, enc fastened in place and the en sembly riveted together. This lowed by welding the co rings to the ends of the roto which project through them forms a complete rotor re be assembled on its shaft.

Vibrating Stacking Pins

Stator laminations proceed the delivery belt to the aut stacking machine shown in F The stacking pins on this m are vibrated to allow the la tions to form a stack as rec This machine also includes sion for shifting the position stacking pins quickly, perm the operator to remove a co stack from one set of pins the other set is being loaded. there is a guide on the be ranged to feed the disks int one of the three stacking When a pin has been filled mechanism can be shifted q to transfer the stream of dis a second pin, permitting re from the first pin without int ence.

Highly mechanized equipmen layout such as the one desc here, of course, are only po where a tremendous volum pieces are required, all of ide size and shape.

All of the cookie disks fed this setup are 6 inches in dia and either 0.017 or 0.025-in thickness. All slots in rotor an tor disks are pierced at one s of the press. Cookie disks ar

(*Please turn to Page* 83)

Fig. 10. (Top)—General view of the up. Rotor disks from the blan presses at left are pressure fed thr skeleton ducts to within easy rea operators who load rotor not presses. Fig. 11. (Center)—Close the rotor stacking machine and conveyor which feeds rotor laminat to this machine on edge. Fig. 12. tom)—Operator removing a load stator laminations from the autom stacking machine fed by a 28-inch conveyor from the stator notch presses

PHILO
Ferro-Alloys Corporation
Canton, Ohio

A Plant Weldery

Methods by which one large fabricator organized an extremely successful welding department are detailed here. Two plant men, given course in welding, train welding operators, educate designers, etc. and show other plant men how to use welding most effectively

By H. THOMASSON
Welding Engineer
Canadian Westinghouse Co. Ltd.
Hamilton, Ont.

BY APPLYING arc welding to the construction of electrical equipment, it has been possible to increase reliability, capacity and structural strength. Welding has many well-known advantages. For maximum efficiency in use of welding, a number of elements are essential.

Regular procedure followed when an order is received or a proposition requested, is to submit the matter to the appropriate engineering division which makes up the electrical design, passing it on to the mechanical section for completion.

Upon receiving the electrical specifications, the mechanical department determines if a design exists that is suitable for the desired application. If not, it determines the general features, type of construction, which parts will be arc welded, etc. Then assembly and detail drawings are made.

Abstract from paper receiving second main award, $2,747.39, in Welderies classification of $200,000 Award Program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland, O., in which savings of $1,600,000,000 were shown available by wider application of arc welding.

Engineering Sheets Standardized

So all divisions may use the same basic forms and methods, Engineering Standard sheets have been developed to cover every possible phase of engineering and draughting activity with complete instructions necessary for uniformity of the drawings and information. Those which have a bearing on arc welded design comprise the calculation of working stresses, design rules and stresses for welding, methods for calculating weld stresses, fusion welding symbols, standards for welded joint design, form and areas for butt welds, strength of circular plates, data pertaining to the concentrated radial loading of rings, finish allowance tables for flat and rolled steel plates and sheets, formula for calculating bends in flat stocks and the used to figure the size of required to form a cone.

Engineering information mitted to the shop through specification, order informa drawings. Each is comple to the other and forms a a standard system.

The process specification comprehensive detailed in for doing the work. On b proved, all departments need them are given copie are filed under the process tion number for future refe

Whenever an order is rece a machine or part not regul ried in stock, a stock order and copies sent to every ment that has work to do or is indicated by the depa designations immediately be shipping date.

In making the drawing piece of material is given number and listed in the bi terial in the upper right h

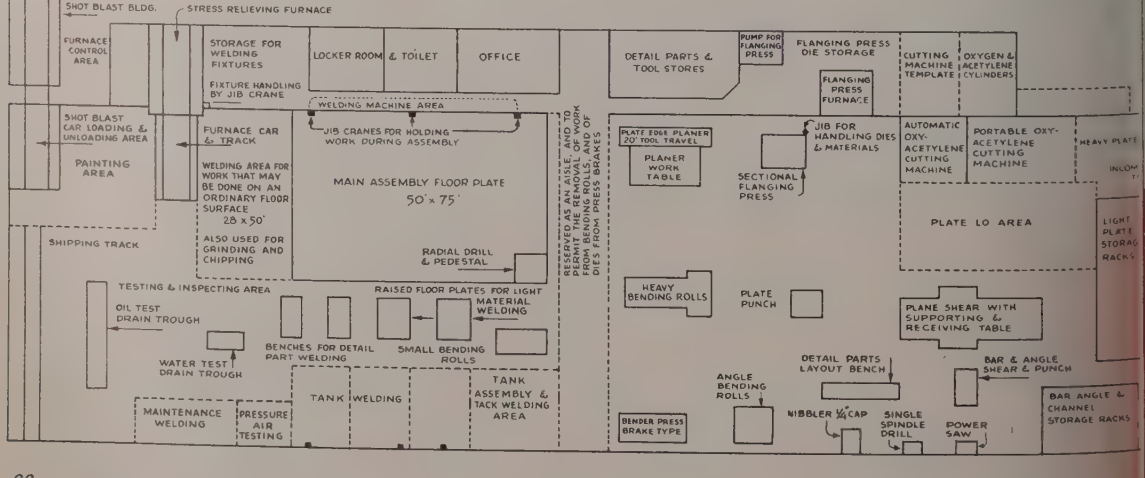
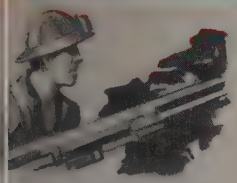

SHOT BLAST BLDG.
STRESS RELIEVING FURNACE
FURNACE CONTROL AREA
STORAGE FOR WELDING FIXTURES
LOCKER ROOM & TOILET
OFFICE
FIXTURE HANDLING BY JIB CRANE
DETAIL PARTS & TOOL STORES
PUMP FOR FLANGING PRESS
FLANGING PRESS DIE STORAGE
CUTTING MACHINE TEMPLATE
OXYGEN & ACETYLENE CYLINDERS
FLANGING PRESS FURNACE
WELDING MACHINE AREA
SHOT BLAST CAR LOADING & UNLOADING AREA
FURNACE CAR & TRACK
JIB CRANES FOR HOLDING WORK DURING ASSEMBLY
PLATE EDGE PLANER 20' TOOL TRAVEL
PLANER WORK TABLE
JIB FOR HANDLING DIES & MATERIALS
AUTOMATIC OXY-ACETYLENE CUTTING MACHINE
PORTABLE OXY-ACETYLENE CUTTING MACHINE
HEAVY PLATE
PAINTING AREA
WELDING AREA FOR WORK THAT MAY BE DONE ON AN ORDINARY FLOOR SURFACE 28 x 50'
MAIN ASSEMBLY FLOOR PLATE 50' x 75'
SECTIONAL FLANGING PRESS
PLATE LO AREA
LIGHT PLATE STORAGE RACKS
SHIPPING TRACK
ALSO USED FOR GRINDING AND CHIPPING
RADIAL DRILL & PEDESTAL
TESTING & INSPECTING AREA
RAISED FLOOR PLATES FOR LIGHT MATERIAL WELDING
HEAVY BENDING ROLLS
PLATE PUNCH
PLANE SHEAR WITH SUPPORTING & RECEIVING TABLE
OIL TEST DRAIN TROUGH
WATER TEST DRAIN TROUGH
BENCHES FOR DETAIL PART WELDING
SMALL BENDING ROLLS
DETAIL PARTS LAYOUT BENCH
BAR & ANGLE SHEAR & PUNCH
ANGLE BENDING ROLLS
NIBBLER ½" CAP
SINGLE SPINDLE DRILL
POWER SAW
BAR ANGLE & CHANNEL STORAGE RACKS
MAINTENANCE WELDING
PRESSURE AIR TESTING
TANK WELDING
TANK ASSEMBLY & TACK WELDING AREA
BENDER PRESS BRAKE TYPE

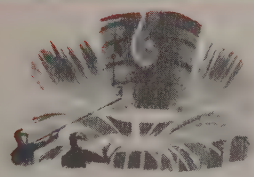
Fig. 1—Plan showing shop floo and equipment location

MATIC CONTROL . . . TOOL OF MODERN PRODUCTION

from OLTEN METAL MOTOR CARS



ores from which we make for automobiles, boats, and res extensive controlled ven- mines, institutions or indus- r air must be controlled to correct volume and humid- le and inexpensive solution Recording Gauges and Recorder-Controllers.



REFINING and smelting ores in reduction furnaces, blast furnace stoves, open hearths and electric furnaces requires close temperature control. Upon this depends the quality of the metal — the serviceability and saleability of the product. Here, Foxboro Pyrometer Recorder-Controllers are invaluable aids in assuring uniform processing conditions.

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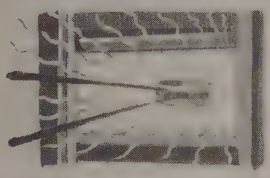
etal into parts for motor s and many other products e economical with Foxboro Cupola Control. Good molds last longer — make better lower unit cost. Good, long- ds and cores are baked in trolled temperatures. An- s where Foxboro Tempera- der-Controller Pyrometers ndable, economical results.



HEAT-TREATING involving annealing, hardening and tempering has been brought to new heights of efficiency through the use of modern Pyrometers. No one Pyrometer can solve the many varied demands. The completeness of the Foxboro line plus the enduring precision of Foxboro Pyrometers assures profitable results.

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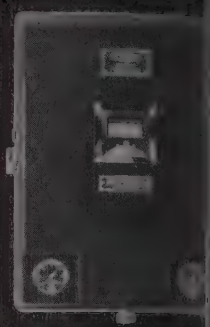

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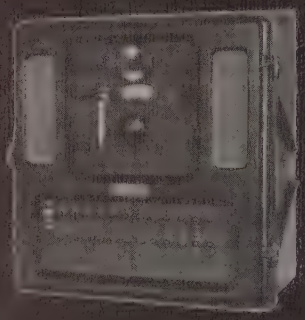

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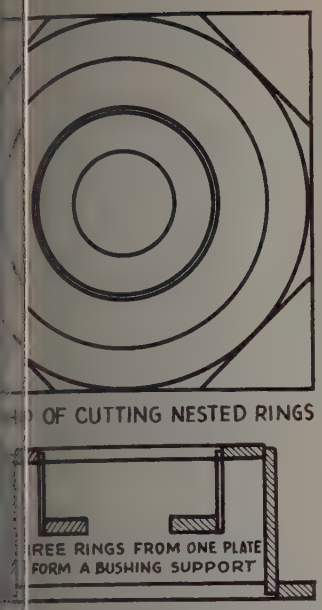


ayouts like this reduce material requirements

he drawing where the name item, the material from t will be made and all di- is are recorded. Stock or- ormation is a copy of the naterial from each required ., but lists only the items by the piece of apparatus . Thus a drawing with a items may have only one r, and that one only would d in the information from awing.

a new drawing has been approved, copies are printed ned in to the blue print de- r. When a change is made awing, it is given a new sub . All new drawings are sub on the first change become A messenger goes around ange the new copies for the s so no old drawing can re- service.

Office Staff

hop office staff consists of a engineer, a cost control schedule man, an informa- k, a time keeper and an of- ior. Supervisory staff on p floor includes a divisional n assisted by a welding in- and two mechanical inspec- aking care of material and nts is a combined receiver- n, and a shipper.

ment required by a depart- ganized to produce machine y arc welded fabrication will vary to a large extent. The essentials are almost unbelievably small, consisting of a power saw and an oxyacetylene cutting outfit to cover preparing parts, with a set of bending rolls added if the product requires cylindrical parts.

Second portion of the work is accomplished to good advantage on a small floor or bench plate, the size of which is largely set by the dimensions of the parts to be built. A vertical plate is a worthwhile tool if box shaped parts are desired, while the addition of several husky C and floor clamps to the usual mechanic's tools of square, hand and sledge hammer, steel scales, chalk lines, etc., complete the requirements for a second portion minimum.

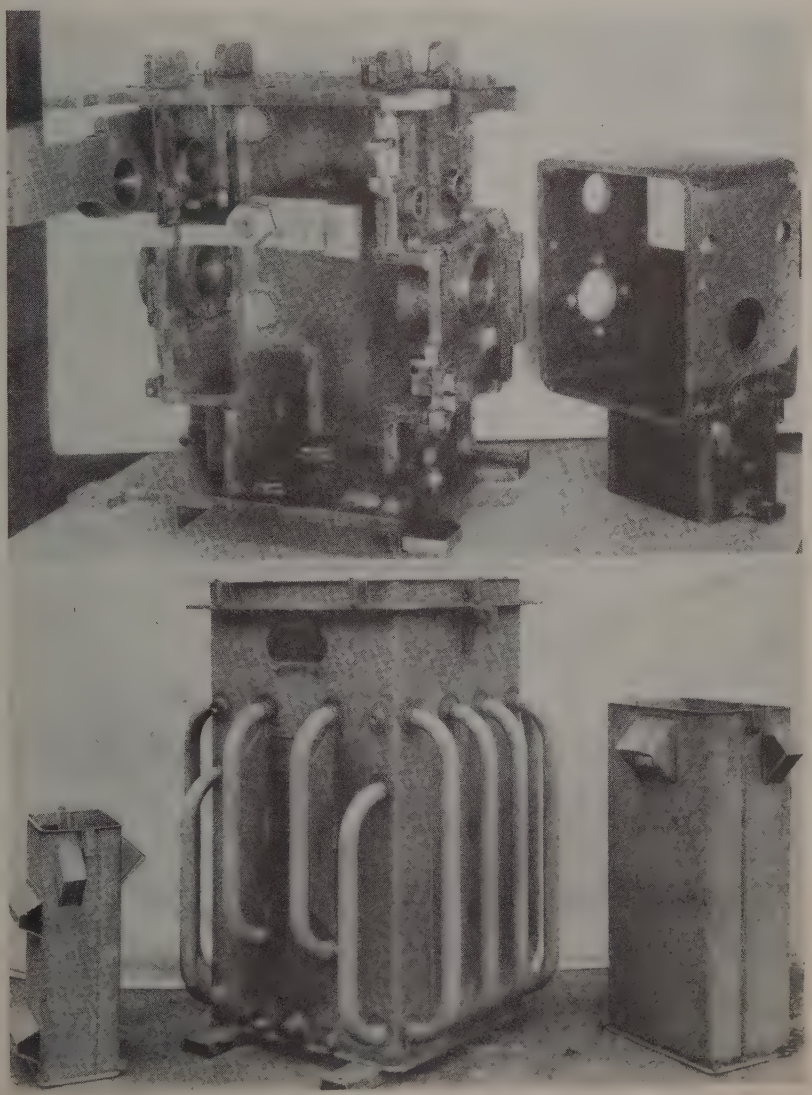
The third section, the actual arc welding, requires an arc welding direct current generator with its drive. This is specified because direct current will work well with any type of electrode in commercial use at the present time. Operator's protective equipment and hand tools consist of welder's helmet, gloves and leather arm protectors along with a hammer, chisel and wire brush.

The shop floor layout in Fig. 1 is based on producing fabricated parts. It is shown not exactly as it exists at present but as the author would have it, if such were possible.

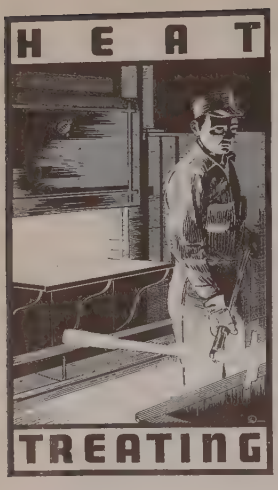
Progressive Inspection

Here four inspections are made as the work progresses. First check is immediately after the layout. Second stage is after assembly and tack welding and before any arc welding is done. This insures that all assembly work is correct before finally fusing the parts together. Third stage is actual arc welding inspection, handled by the arc welding inspector only. This is a continuous procedure as welding progresses, the inspector examining the work as it is being done. Fourth and final inspection is made just prior to the shot-blast cleaning.

(*Please turn to Page* 82)



(Upper)—Arc welded, box-type and frame it is used to drill. (Lower)—Small welded steel transformer tanks



Valve Steels

Need for higher strengths and better resistance to oxidation in automotive engine exhaust valves spurs research and results in development of superior materials. Three groups of steels are now in general use, one being entirely new in the field

By A. T. COLWELL
Vice President
Thompson Products Inc.
Cleveland

DEVELOPMENT of new and better steels for use in aircraft and automotive engine valves has been going ahead quietly to the point where today a number of analyses have been perfected which appear to be "tailor-made" for the application. Summary of this research and attendant metallurgical data are presented in the accompanying article abstracted from a recent paper before the Indiana section, Society of Automotive Engineers.

■ AIRCRAFT exhaust valve steels of today have been fortified on working surfaces to the extent the steels simply are carriers for improvements. The valve shown in Fig. 1 affords an example. The base steel is a high chrome-nickel austenitic steel; the tip is high-carbon tool steel; the seat is puddled Stellite and the stem is nitrided; the cavity carries metallic sodium as a coolant. This seems a long way around to get a satisfactory valve, but these valves operate over 5000 hours without trouble, and such dependable operation is essential in aircraft.

These exhaust valves are all made up by the extrusion process. The grain flow of the extruded forging is ideal. Careful heat treatment and control of forging temperature are maintained to get proper grain size and structure.

This type of steel is subject to intergranular corrosion, and rigid control is necessary in its fabrication. Fig. 2 shows normal microstructure. Under certain conditions the sodium coolant will attack the interior of the valve, causing failure.

Aircraft engine builders have contributed greatly to improved valve performance. Good cylinder designs, steel seat inserts, bronze guides, forced and metered lubrication, excellent alignment and finish of all parts, and good cam design, have all helped.

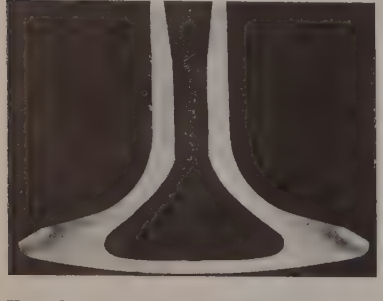


Fig. 1—Section of hollow-head aircraft valve with Stellite seat

Considering automotive valves for a moment, the problem is really more difficult than with aircraft valves. The aircraft engineer may use any means available to get dependable performance, but the automotive engine designer usually is working to a budget and hence is limited in valve design. Most design work is applied to adjacent parts, such as the seat insert, block cooling, exhaust passage, guide cooling, springs and the cam. Most actual valve work centers on material, and real progress is being made there.

For many years a standard automotive valve steel has been Silcrome No. 1. Some five years ago it became evident Silcrome was no longer good enough in some truck and bus motors, and this was also the danger signal for automobile engines. Research work was started to find a steel better than Silcrome, from the standpoints of strength and oxidation or corrosion resistance. In this study a large number of steel analyses were studied, falli the two older groups of har and nonhardenable (or aust and a new group, about whic not know too much as yet, b ably in the precipitation ha group.

1. *The Hardening Gro* hardenable group of steels made oxidation and corro sistant, can be tip hardened pet wear; is easy to mach grind; has low coefficient o sion; but this group is defi hot strength properties.

2. *The Austenitic Gro* austenitic group can be giv oxidation and corrosion re and has excellent hot stren it is more difficult to forge chine; cannot be hardened; ject to carbide precipitation; pits badly on the seat; an high coefficient of expansion

3. *The Precipitation Ha Group.* The precipitation ha group can be given excellen tion and corrosion resistanc seat, stem and tip; go strength. Its coefficient of sion is higher than Silcrom but lower than the austeniti But it is difficult to forge chine, and is low in impa unless carefully handled.

Thus, any valve steel is promise, the steel being sele

Fig. 2—Normal microstructur craft valve steel. X 1

5-HOUR CYCLE for Annealing Malleable Castings

Short-Cycle Continuous Furnace installed in a mid-western manufacturing plant. Designed and built by Holcroft & Company, Detroit.

Lining: 9 in. of B & W K-26 Insulating Firebrick, backed up with 5 in. of B & W K-20; sprung arch, 9 in. of K-26. Dimensions of chamber: 53 ft. by 7½ ft. wide by 3¼ ft. high. Temperature zones vary from 1700 to 1250 F. Capacity: 2 tons in 24 hours. Fired with gas—4 radiant tubes and 15 cooling tubes.

Work goes through this up-to-date furnace in only 15 hours—a remarkable short cycle.

One of the features promoting efficiency is the use of B&W Insulating Firebrick as furnace lining, which assures close temperature control and even heating of the work. Fuel consumption is reduced by reason of the ability to reach operating temperature quickly after a shut-down, and by low radiation loss.

B&W Insulating Firebrick are today saving money for the owners of practically every type of industrial furnace—write for Bulletin R-2-F, which contains technical data.

THE BABCOCK & WILCOX COMPANY
Refractories Division
19 Rector Street New York, N. Y.

R-84

Fig. 3—Cracked valve head caused by too low forging temperature

are not recommended on this type of steel.

The price of the steel is comparable to Silcrome, thus giving a higher quality valve at approximately the same price. It is now used by Autocar, Buick, Buda, Chevrolet, Chrysler, Continental, Hudson, Graham-Paige, International Harvester and Pontiac.

Silcrome X-10 Steel. This is a low-priced, austenitic steel which excels Silcrome No. 1 in hot strength and impact value, hot hardness, corrosion and oxidation resistance. It

Table I

Analyses of Valve Steels

	Silcrome No. 1, per cent	Silcrome XB, per cent	Silcrome X10, per cent	Silcrome XCR, per cent
Carbon	0.40-0.50	0.60- 0.86	0.30- 0.45	0.40 - 0.50
Manganese	0.20-0.60	0.20- 0.60	0.80- 1.30	1.00 (max.)
Phosphorus	0.02 (max.)		0.03 (max.)	0.035 (max.)
Sulphur	0.02 (max.)		0.03 (max.)	0.035 (max.)
Silicon	3.00-3.50	1.25- 2.75	2.50- 3.25	1.00 (max.)
Chromium	8.00-9.00	19.00-23.00	17.50-20.50	23.25 -24.25
Nickel		1.00- 2.00	7.00- 9.00	4.50 - 5.00
Molybdenum				2.50 - 3.00

Table II

Physical Properties of Valve Seats

	Silcrome No. 1	Silcrome XB	Silcrome X-10	Silcrome XCR
	Ferritic hardenable	Ferritic hardenable	Austenitic, non-hardenable by heat treatment	Precipitation hardenable
Hot workability	Good	Good	Good	Fair
Hot extrusion	Good	Good	Fair	Fair
Machinability	Good	Good	Fair	Poor
Hot strength, pounds per square inch at 160 degrees Fahr.,*	4690	7625	17,500	20,000
Scalding temperature, degree Fahr.	1800	2150	2200	2200
Maximum hardness C Rockwell	56	50	45	50
Coefficient of expansion	0.0000078	0.0000078	0.000011	0.000009
Warpage	Poor	Good	Good	Excellent
Stainless properties	Fair	Excellent	Very good	Excellent
Corrosion resistance	Poor	Excellent	Fair	Excellent

* Hot strength is given by a slow pull, which is the proper method. The values are lower than often are quoted on Silcrome, but are accurate. All these values are much higher on a fast pull.

the qualities most needed in any particular job. Three steels practically have replaced all Silcrome No. 1. Analyses and physicals are shown in Tables I and II.

Silcrome XB Steel. This steel is of the ferritic, hardenable type and can be hardened to 65 plus, scleroscope, thus giving the hard tip which is desirable. Its strength at heat is appreciably higher than No. 1 Silcrome, but is lower than the austenitic steels. The critical temperature is lower than No. 1 Silcrome, which is undesirable, but all other properties are superior, and valves have so proved in actual test.

It has excellent corrosion and oxidation resistance, closely approximating the austenitic steels, wears well, gives good seat and stem performance, forges and machines easily. Maximum hardness is slightly under Silcrome No. 1.

The steel has the same coefficient of expansion as Silcrome and therefore can use the same tappet and guide clearance. Valve seat inserts

cannot be hardened by h
ment, but does mechanica
to 45-50 scleroscope. For
gines, no additional tip is
but for overhead engines
tip is recommended.

The coefficient of exp
about 50 per cent greate
crome No. 1. Cam design w
the added clearance neces

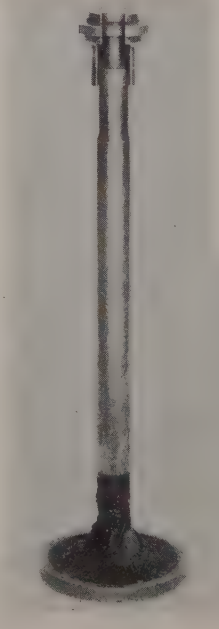
This steel is apt to sh
seats and scuffed stems; b
erally has less defects af
than the hardenable stee
of this steel deteriorate
held off the seat, but per
when properly seated. I
critical temperature, and
tendency to warp is mini

The steel is now used
Chrysler and White.

Silcrome XCR Steel. Th
sidered the best of the pre
motive valve steels, but is
pensive than the other typ
A glance at the analysis
cate this. It has the ferritic
of hardenability, with the
property of high strength
falls definitely into neith
The analysis would indic
austenitic, yet it can be
with a 14 hour draw at 145
Fahr. We are not sure
causes the hardening, but
some forms of precipit
shrinks during hardenin
0.002-inch per inch of leng
must be carefully calculate
reason, to locate retainer
peated heatings do not a
steel appreciably. XCR mai
hardness at heat remarka

Valves made from XCR
ened all over to sclerose
The seat hardness is a
beneficial.

Silcrome XCR has excell
sion and oxidation resista
hot strength. The hard seat
wear exceptionally well-
the seats look more ne
Stellite than any other
terial. The impact value is



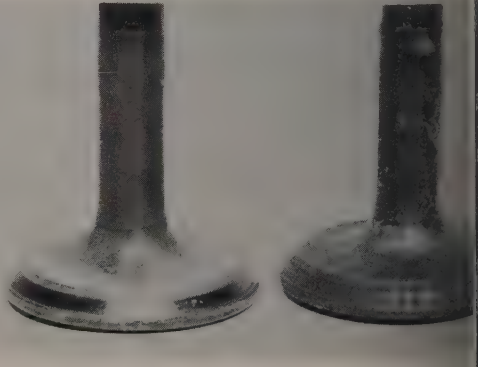
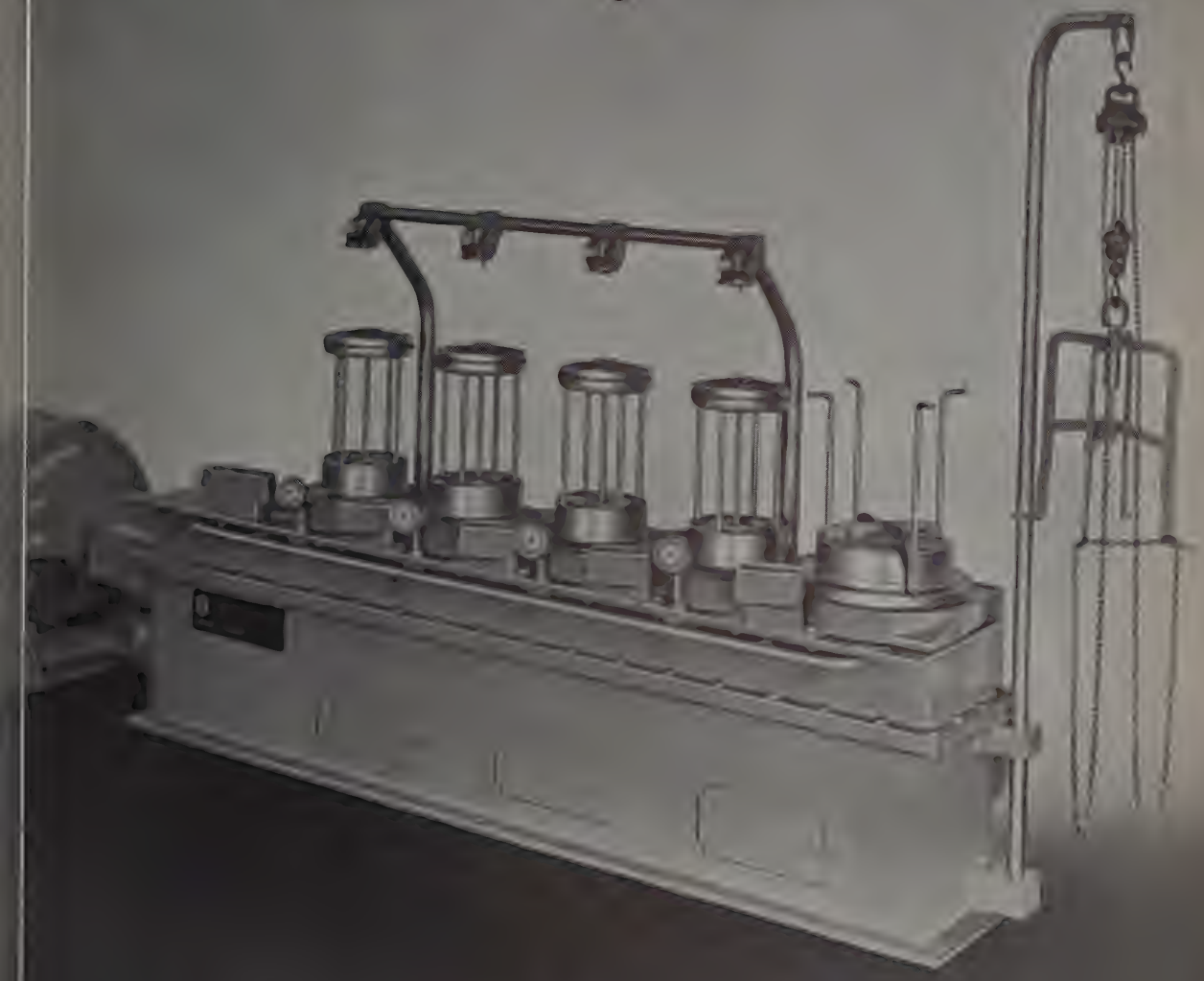


Fig. 4 (left)—Valve spring cap which permits
of the valve. Fig. 5 (below)—Condition of va
Left, valve rotating; right, valve not ro

ETNA GROUP DRIVEN

re Drawing Machine



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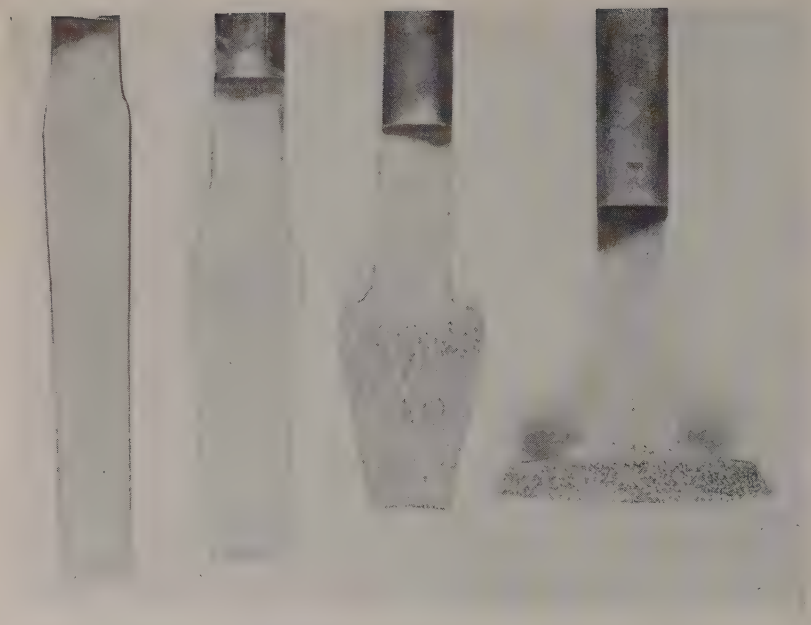


Fig. 6—Grain flow in valves made by gather-upset process

being considerably under that of Silcrome No. 1 and Silcrome XB, and far below the austenitics; the steel therefore must be handled carefully, both at the mill and in manufacture. The low carbon type gives best hardness, but the higher carbon gives better impact value Scale is tightly adherent.

Inasmuch as this is a new type of steel as used for valves, there are some interesting points connected with its development. Its hardenability was discovered by accident. A bar happened to be left on the hearth of a furnace for a long time. A workman later tried to cut it, but being unable to do so, reported to his metallurgist that the steel was hard—it would not cut. The metallurgist replied the steel could not be hardened. The workman replied, "Perhaps not, but here it is—hard;" —and it was.

The steel must be forged within a 25-degree range—if overheated, it loses the ability to harden; if forged too cold, it tends to shatter. Fig. 3 illustrates an example of shattering in a valve forging caused by forging at too low temperatures. The analysis and treatment must be watched carefully to give proper impact value. Although hard, it is difficult to grind. It is magnetic when soft and nonmagnetic when hard.

The steel has been adopted by Allis-Chalmers, Autocar, Chrysler, International Harvester, Oldsmobile and Sterling Engine, and has been approved by several others.

Rotating Valves. Some time ago the Ethyl Gasoline Corp. ran a test on a controlled, slowly rotating valve. The result was particularly good. We repeated these tests, and got good results. A device has been developed which causes the valve to rotate slowly, which is shown in Fig. 4. Its design is such that the retainer cap is slightly longer than the valve stem; hence when the tappet makes contact, the spring is compressed before the valve starts to lift, and the valve is then entirely free, and takes a slowly turning motion from the

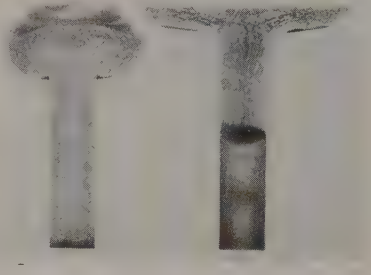


Fig. 7—Grain flow in valves made by electric upset process

Fig. 5 shows the result o with and without the devi indicate the rotating valv definitely better seat, but w with a hard seat valve, such or the Stellited aerotype.

Grain flow in valve forgi interesting study. Figs. 6, show, respectively, three me making valves: gather-up trical upset, and extrusion. tory valves can be made b these methods, but Thomp neers favor the extrusion pr exhaust valves and the e upset method for intake Grain flow is more uniform extrusion sample.

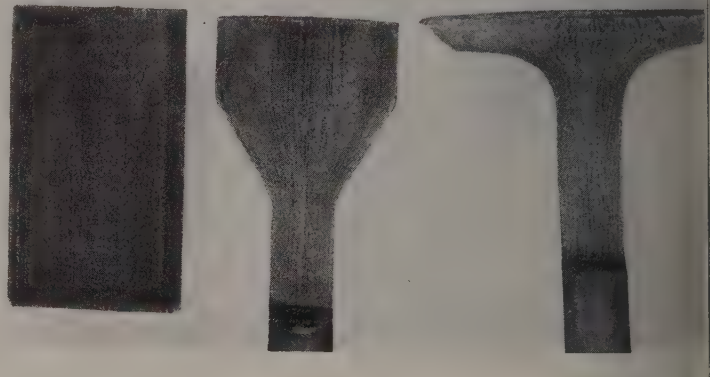
Special furnaces are u forging and heat treating, perience has taught the i factors to be controlled in p a good valve forging. One s tor is the system of preheat lowed by soaking of the pie forged, time and temperatur accurately controlled.

Surface treatment of th such as valves is receiving e among the various manuf because it has been demo that extremely beneficial res be obtained by surface tr The Perfect Circle Co., Hag Ind., for one has been activ work for the past two years ating the Ferrox treatment, treatment at high temperat

The Standard Oil Co. of Ca has developed the Feritex which also gives a surfac ment, but in a somewhat manner. Feritex is an process giving a sulphide

In general, the treated alters the gummy or soft fe that it does not tend to pick up on the rubbing pa oxide or sulphide also acts a rouge in bringing the movi to a seat, and prevents th high rate of wear while fizz worn from the parts. The p ties of this type of treatm just being realized.

Fig. 8—Grain flow in valves the extrusion process



CHANGE TO GENERAL ELECTRIC A-C WELDERS PAYS BIG DIVIDENDS

In building boilers the Burnham Boiler Corporation uses G-E a-c arc welders to save time, reduce costs, and avoid reworking of welds

At Burnham Boiler Corporation

SOME time ago, the Burnham Boiler Corporation replaced the direct-current arc welders at its Geneva, N. Y., plant with G-E alternating-current units and changed its methods of plant operation. Here are the results it obtained:

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[illegible]-per-cent reduction in power and maintenance costs

[illegible] months after the installation, this company found that the benefits had already paid for the new equipment. Many other manufacturers whose production work involves shop welding of mild steel are finding that G-E alternating-current welders are real money makers.

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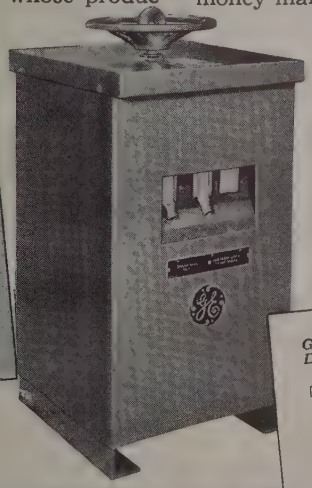

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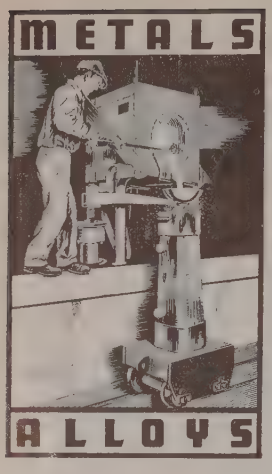
GENERAL ELECTRIC



Oil Well Bits

Called upon to give unfailing operation under severe conditions of abrasion and strain, bits for drilling oil wells must combine high surface hardness or abrasion resistance with maximum toughness. Certain new alloys produce good results in such service

By **NOLAN J. CLARK**
Asst. Chief Metallurgist
Reed Roller Bit Co.
Houston, Tex.

■ THREE MILES straight down on a slender stem of steel is a small unit grinding away. This bit must penetrate material varying widely in physical properties. Quartz, limestone, sandstone, pyrites and gypsum are some of the rocks and minerals encountered, as well as complex ore bodies.

Churn type drills were used in the first oil fields in the East. With the increasing demand for petroleum, the rotary drill was developed with a fish tail bit made from forged steel, and from this evolved the modern rock bit used on a similar drill stem. At present, practically all oil prospecting is done with rotary drilling tools. The softer formations, clay, shale and some soft rock, can be cut to advantage with fish tail bits but harder formations require bits which do not take so much shock and which will sand higher pressures than the fish tail. To meet this demand, the rotary rock bit has been developed.

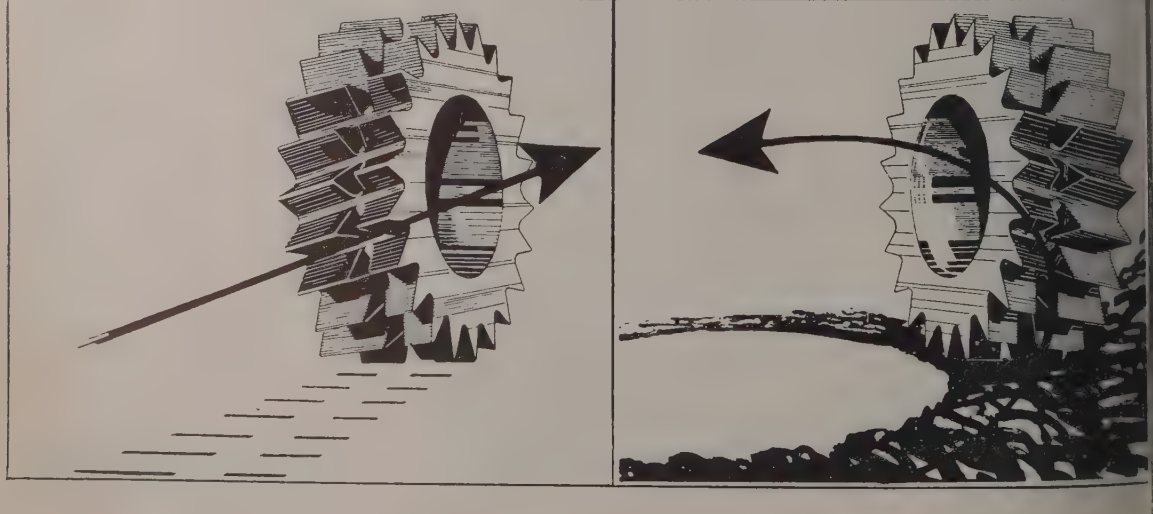
This bit, making use of the same scraping action as the fish tail, combines other actions which permit the cutting edges to be multiplied by a number of teeth on a cylindrical or tapered cutter. See Figs. 1 and 2. The cutter is free to turn on its axis and thereby relieves to some extent the strain that each cutting edge is called upon to bear.

At the same time the teeth are pressed down in the formation, resulting in high abrasion of the cutting surfaces of each bit. This abrasive action calls for the hardest of materials to withstand the attack. The first roller type bits were made of carburized steel to get maximum surface hardness backed by [illegible] core. This combination of [illegible] ties, maximum hardness or [illegible] resistance and maximum tou[illegible] is different to produce in[illegible] While carburized steel to s[illegible] tent met these problems, i[illegible] now has developed harder a[illegible] abrasion resisting materials.

Welding harder metals on [illegible] face presented a method of [illegible] ing the wear resistance and [illegible] ber of combinations of alloy[illegible] used over a period of time[illegible] ganese, chromium molyb[illegible] cobalt and tungsten were [illegible] alloying elements for these [illegible] ing materials. Carbides, [illegible]

Abstract from "Foote-Prints" published by Foote Mineral Co., Philadelphia.

Fig. 1. (Left)—When rolle[illegible] straight line, cutter does n[illegible] the surface. Fig. 2. (Right)—W[illegible] forced to take a circular path[illegible] ever, the teeth twist and t[illegible] formation they penetrate. [illegible] the action of the roller bit sh[illegible] Fig. 3 when drilling



rides all offered some prom- difficulty was experienced in welded surfaces of most e alloys that would have uni- roperties.

done in European countries ally in this country led to the ment of cemented tungsten s bonded by a tough material s cobalt. This indicated the ity of using the hard, brittle of tungsten in a tough which would have some of perties of each. The process ing these cemented carbides expensive and their attach- cutting tools can be accom- only by brazing. For these their use in oil well tools n quite limited.

ngsten Carbide On Bits

ately, fine grain tungsten powder was applied directly utting surfaces of bits. This st accomplished by puddling- base metal of the bit with a arc so it surrounded the n carbide particles, thus pro- a surface containing a large of small particles of tung- rbide. A number of other s have been developed for lishing the same result. It en found by judicious addi- the steel and regulating the s of heating that the over-all ies of the hard-face overlay controlled to a certain ex- Tungsten carbide of various izes can now be applied by lectric arc or torch methods ling. In all cases the over- sists of a matrix of some fer- loys, either sweated-up from

Rock bit cutters as used in a roller bit showing location of tungsten carbide on the faces of the teeth

the base metal or added in the form of a thin-wall tube which is filled with carbide particles and which is melted down around the grains.

Making Tungsten Carbide

Tungsten carbide is made from tungsten powder and carbon in an electric furnace and consists of a mixture of several carbides of tungsten. Economical methods of making it have been developed to yield a fine grain metal with maximum ductility. A cast button of the material is crushed to a screen size best suited for the purpose, producing sharp edged, irregular grains. The steel binder used to cement the grains to the base metal, alloys with the carbide to such an extent that a strong bond results.

By the above methods, tungsten carbide can be applied to all surfaces of rock bits used to drill hard

Fig. 4—A fishtail bit with tungsten carbide inserts before being used

formations. Even the old fish tail bit has been rebuilt to take tungsten carbide. The same granular carbides find a great use on the faces of these bits and a certain reinforcing of the cutting edge is accomplished by inserted tungsten carbide "fingers" extending downward from the cutting edge. The effect of these on drilling can be clearly seen in the fingering wear shown in accompanying illustrations.

The cuttings made by all bits in the rotary class are removed from the hole by forcing an aqueous fluid down the hollow drill stem and up the outside between the drill stem and the wall of the hole. This fluid

Fig. 5—The same bit will look like this after being worn in service. The carbide inserts cause the "fingering" action shown here

carries a great amount of slush which is often quite abrasive. Tungsten carbide and alloys containing them have been used to advantage where this slush causes severe wear in restricted areas such as the slush tubes in bits.

It is possible to cast tungsten carbide in tubes or liners of a wide variety of shapes. Many of these special shapes are made from tungsten carbides that have some metal such as cobalt added for the purpose of decreasing their brittleness. This, however, lowers the overall hardness.

Automotive Construction From French Viewpoint

■ *Automobile*, by Georges Mohr; fabrikoid, 531 pages, 3¾ x 5¾ inches; published by Dunod, Paris, France; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S. W. 1.

This French volume is a compendium of information for automobile engineers and others associated with the industry. The volume is pocket size, divided into three main divisions, of which the first is concerned with formulas for study and construction of motors and automobiles and contains summaries on mathematics, physics, mechanics, chemistry, etc. The second section is devoted to automobile construction materials. The third deals with motors, clutches, gear shifts, transmissions, differentials, brakes, etc.

Foundrymen Announce Program for Annual Convention in Cincinnati

■ AN ELABORATE program of sessions, dinners and special features has been arranged for the forty-third annual convention of the American Foundrymen's association at Hotel Gibson, Cincinnati, May 15-18. Technical sessions offer a wide range of papers and committee reports on steel, gray iron, malleable and nonferrous foundry practice; refractories; sand research; patternmaking; foreman and apprentice training; public relations; safety and hygiene; time study; and costs.

Among special features will be the annual business meeting and board of awards lecture on May 17; the annual dinner and medal awards on the evening of the same day; a course of three lectures on cast iron metallurgy; the usual shop operation course; and numerous plant visitations. No exhibition will be held this year.

Details of the convention sessions are as follows:

Monday, May 15

MORNING

Opening Session

Address of welcome.

President's address, by Marshall Post, vice president and works manager, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Malleable Cast Iron

"Atmospheres for Malleable Iron Annealing—Their Properties and Applications," by John Dow, Holcraft & Co., Detroit.

"White Iron for Malleablizing," by J. O. Klein, Texas Foundries Inc., Lufkin, Tex.

"Shearing of Malleable Iron Gates," by S. D. Martin, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich.

Nonferrous

"Production of Bronze Pressure Castings," by D. Frank O'Connor, Walworth Co., Boston.

"Crucible Melting," by G. K. Eggleston, Detroit Lubricator Co., Detroit.

Gray Iron Shop Course

Session 1—"Cupola Practice." Discussion leader: Donald J. Reese, International Nickel Co. Inc., New York.

AFTERNOON

Plant Visitation

Cincinnati Milling Machine Co.

EVENING

Malleable

Dinner and roundtable conference. Discussion on current practices.

Materials Handling

"Mold Equipment," by W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa.

"Some Tests on Effectiveness of Water Under High Pressure for Cleaning Castings," by R. Webster, Hydroblast Co., Chicago.

Nonferrous

"Effects of Aluminum and Antimony on Physical Properties of Red Cast Brass (85-5-5-5)," by H. B. Gardner and C. M. Saeger Jr., national bureau of standards, Washington.

"High-Conductivity Copper Castings," by A. B. Kinzel, Union Carbide & Carbon Research Laboratories, New York.

Annual business meeting of nonferrous division.

Lecture Course

Session 1—"The Microscope in Elementary Cast Iron Metallurgy," by R. M. Allen, metallurgical consultant, Bloomfield, N. J.

Tuesday, May 16

MORNING

Gray Iron Shop Course

Session 2—"Production of Uniform Dense Structures in High Test and Alloy Iron Castings," by M. A. Scott, Greenlee Foundry Co., Chicago.

Malleable

"Effects of Manganese on Second Stage Graphitization," by D. P. Forbes, Gunite Foundries, Rockford, Ill.

"Hydrogen in Solid White Cast Iron," by H. A. Schwartz and G. M. Guiler, National Malleable & Steel Castings Co., Cleveland.

Gray Cast Iron

"A Scientific Approach to a Foundry Problem," by L. A. Danse, Cadillac Motor Car Co., Detroit.

"60,000-Pound Cupola Iron," by E. L. Roth, Motor Casting Co., Milwaukee.

"Castings for the British Gas Industry," by F. Whitehouse, Newton, Chambers & Co. Ltd., Chapeltown, England. Exchange paper of Institute of British Foundrymen.

Nonferrous

"The Foundry and Metallurgical Science," by M. G. Corson, New York.

"Influence of Pouring Ladles on Quality of Red Brass," by R. W. Parsons, Ohio Brass Co., Mansfield, O.

Apprentice Training

"Apprentice Training," by Herman K. Ewig, Cincinnati Milling Machine Co., Cincinnati.

"Foundry Apprenticeship," by M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

NOON

Nonferrous

Luncheon and roundtable meeting.

AFTERNOON

Safety and Hygiene

"Establishment of a Safety and Hygiene Program in a Small Foundry," by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, O.

"The Open House and Public Relations," by W. H. Doerfner, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich.

Castability of Metals

"Castability of Cast Steel," by C. H. Lorig and E. C. Kron, Battelle Memorial institute, Columbus, O.

"Effects of Superheating on Castability and Physical Properties of Gray Iron," by N. A. Ziegler and H. W. Northrup, Crane Co., Chicago.

"Measurement of the Fluidity of Aluminum Alloys," by L. W. Eastwood, Aluminum Co. of America, Cleveland.

"Malleable Iron Castability Tests," by E. J. Ash, University of Mi[chigan], Arbor, Mich.

Lecture Course

Session 2—"The Microsco[pe in] mentary Cast Iron Meta[llurgy]," R. M. Allen, metallurgical [consultant], Bloomfield, N. J.

EVENING

Engineering Instruc[tion]

Dinner meeting.

Refractories

"Plastic Cupola Patching," Wilke, John Deere Tractor [Co.], loo, Iowa.

"Refractories in the Steel F[oundry]," A. V. Leun, Bethlehem [Steel Co.], Bethlehem, Pa.

Time Study

"Practical Approach to M[odern] Time Study," by G. J. S[chaefer], Westinghouse Electric & [Mfg. Co.], East Pittsburgh, Pa.

Wednesday, May 17

MORNING

Gray Iron Shop Cou[rse]

Session 3—"Cupola Refrac[tories] Figuring Mixes," Discuss[ion] J. A. Bowers, American Cas[t Iron] Co., Birmingham, Ala.

Gray Iron

"Rapid Temperature Measur[ement] Cast Iron with an Immersi[on] couple," by F. Holtby, Un[iversity] Minnesota, Minneapolis.

"Copper-Aluminum-Silicon Al[loy] tions to Cast Iron," by V. [Paschkis] and T. Barlow, Battelle Me[morial] stitute, Columbus, O.

"Influence of Undercooling [on] Graphite Pattern of Gray [Iron]," R. Schneidewind and C. D'A[rcy] versity of Michigan, Ann Ar[bor]

Foreman and Apprentice T[raining]

"Foundry Apprentice Trainin[g] sential to Foreman Training," Luebke, Fairbanks, Morse [Co.], Beloit, Wis.

"A Foundrymen's Approach t[o] Training," by W. G. Conner [Steel] worth Co., Greensburg, Pa.

Steel

"High Alloy Steel Castings for [Low] Corrosion Resistance," by J. [Mack] field, Michigan Steel Cast[ing] Detroit.

Report of committee on imp[act]

Report of committee on ra[dio]

"Gamma Ray Radiographic [Study] of U. S. Navy for Steel Ca[st] Pressure Service," by N. A. K[ing], York navy yard.

"Copper as an Alloying El[ement] Some Cast Steels," by C. T[ull] and C. H. Lorig, Battelle Me[mo]stitute, Columbus, O.

Sand Research

"Properties of Resin Bonded [Sand]," Emile Pragoff Jr., Hercules [Powder] Co., Wilmington, Del.

"Hot Strength and Collapsi[bility] Foundry Sands," by H. W. D[ietert], E. E. Woodliff, Harry W. D[ietert], Detroit.

Annual Business Meeti[ng]

Election of officers.

Committee reports.

Board of awards lecture.

AFTERNOON

Steel

"A Rapid Method for Determi[nation] bon in Plain Carbon Steels [for] trol Purposes," by H. H. Bl[ack], neapolis Electric Steel [Co.], Minneapolis.

"A Discussion on Steel Castings [of] High Mechanical Properti[es]," George Delbart, Societe Fran[çaise]

ructions Mecaniques, Paris,
e. Exchange paper of Associa-
echnique de Fonderie De France.
of committee on heat treatment.
tic Bonded Steel Molding Sands,"
W. Briggs, Steel Founders' So-
of America, Cleveland, and R. E.
, naval research laboratories,
stia, D. C.
of committee on coupon tests.

Sand Research

its of Petrographic Study of
ng Sands," by R. E. Grim, Illinois
gical survey, Urbana, Ill.
Composition and Textures of
lay Grade of Molding Sand," by
Schubert, University of Illinois,
a, Ill., and R. E. Grim, Illinois
gical survey, Urbana, Ill.
of sand research committee.

Foundry Costs

g Costs," a committee report.
g Costs," a committee report.

Lecture Course

3—"The Microscope in Ele-
ary Cast Iron Metallurgy," by
Allen, metallurgical consultant,
nfield, N. J.

EVENING

Annual Dinner

ation of medal awards. (See
April 10, p. 22.)

Thursday, May 18

MORNING

Gray Iron Shop Course

4—"Cupola Operation," by John
Lansing, Mich.

Symposium on Melting Practices

Electric," by W. G. Finster, Read-
Steel Castings division, American
& Cable Co., Reading, Pa.
Electric," by C. W. Briggs, Steel
ders' Society of America, Cleve-

Open Hearth," by J. W. Porter,
ican Steel Foundries, East Chi-
Ind.
Open Hearth," by W. C. Harris,
boro Steel Foundry & Machine
Birdsboro, Pa.
rter," by F. B. Skeates, Link-Belt
Chicago.
tion Furnaces," by G. F. Land-
Lebanon Steel Foundry, Lebanon,

Gray Iron

nce of Composition on Physical
erties of Gray Iron," by R. G.
wee, Vanadium Corp. of America,
oit, and R. Schneidewind, Uni-
ty of Michigan, Ann Arbor, Mich.
Factors in Hardening and Tem-
g Gray Cast Iron," by V. A.
y, G. A. Timmons and A. J.
g, Climax Molybdenum Co., De-

s of Heat Treatment on Combined
on and Physical Properties of
Iron," by S. C. Massari, Associa-
of Manufacturers of Chilled Car
is, Chicago.

Pattern Making

Pattern Making Problems," by
Kolb, Caterpillar Tractor Co.,
a, Ill.

NOON

Gray Iron

ron division luncheon.

Steel

ivision luncheon and roundtable.
ission topics: "Deoxidizers;" "Re-
on of Silicon from Slag."

AFTERNOON

Plant Visitation

on Coke & Iron division, Ameri-
Rolling Mill Co., Hamilton, O.

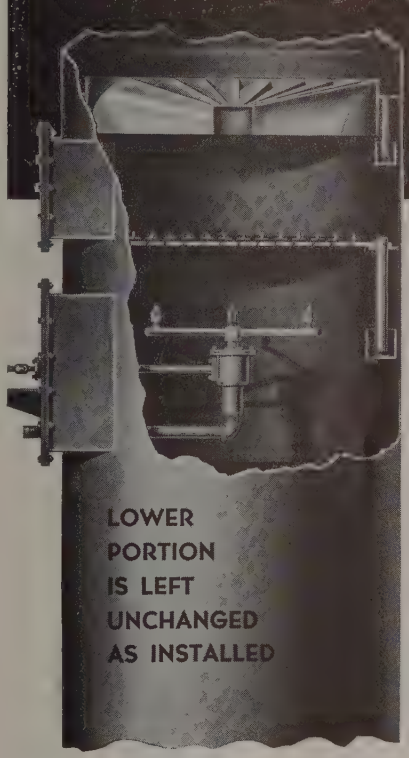
Strength of Tin Affected by Antimony

■ A new publication, A-78, of International Tin Research and Development council treats mechanical properties of alloys of tin with from 2 to 18 per cent of antimony.

In chill-cast, rolled strip and extruded wire specimens it was found that little improvement was obtained by using more than 9 per cent of antimony. Progressive amounts of cold-work on the hardness was studied in the case of three alloys containing 4.5, 7 and 14 per cent of antimony and it was found that, in the case of the first two, reduction of from 10 to 30 per cent caused a permanent hardening. The 14 per cent alloy was considerably harder as chill-cast but was not hardened by mild reduction and on the contrary was softened by severe reduction although there was a slight recovery with time. On annealing after reduction there was with all the alloys a recovery of hardness to values near those of the chill-cast specimens, showing definitely the value of annealing.

Copies may be obtained from International Tin Research Development council, 149 Broadway, New York.

Clean-Dry BLAST FURNACE GAS



from your PRESENT Scrubbers

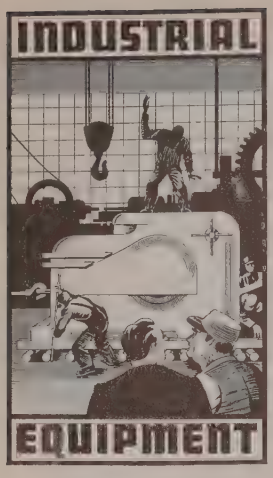
Existing cooling and scrubbing towers can be made into truly efficient washers by installing PEABODY TRIPLE ACTION cleaning and drying units near the gas outlet. Nothing needs be disturbed in the general arrangement below. Cleaning can be provided for any required volume of gas, with operation amazingly economical.

Coal, limestone dust, coke breeze, fume and other impurities are definitely removed, leaving gas suitable for any desired purpose. We invite your inquiry for improving the efficiency of installed equipment.

PEABODY also builds complete scrubbing units from the ground up. See Bulletin H-101.

PEABODY Bulletin H-201 Describes the Triple Action Scrubber Fully. Send for a Copy.

PEABODY ENGINEERING CORPORATION
580 Fifth Avenue, New York
OFFICES IN PRINCIPAL CITIES



New Type of Motor Drives Portable Grinder

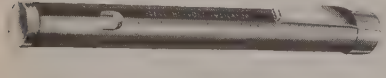
■ Gaston Power Tools, Evergreen Park, Ill., has placed on the market a new type portable grinder which is said to cut fast and leave a smooth path even when coarse grinding wheels are used.

Grinder has two bearings and no gears. Motor develops a maximum

of 2 horsepower, has no brushes and winding is enclosed in dust-tight case. Weight of grinder is only 15 pounds, but it will drive a 7-inch disk grinding wheel at speed of 3400 revolutions per minute. Unit is designed to operate directly from regular 220 volt, 3 phase 60 cycle power circuit.

High Voltage Indicator Utilizes Static Field

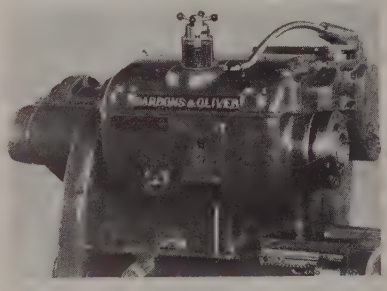
■ Ideal Commutator Dresser Co., Sycamore, Ill., has developed an extremely sensitive, pocket type, high-voltage indicator. A glow tube lights when indicator is held in a changing static field such as is found surrounding belting, high fre-



quency and X-ray equipment, alternating current circuits, pulsating direct currents, condenser discharges, automobile ignition, etc. It is not necessary to touch conductor. Device positively indicates presence of voltages of 2000 and over at several times flash-over distance from a noninsulated conductor. Case is hard rubber, fitted with pocket clip. Indicator takes no more space than a fountain pen.

Develops Spindle Speed Preselector for Lathes

■ Bardons & Oliver Inc., 1133 West Ninth street, Cleveland, recently introduced a single lever spindle speed



preselector for its Nos. 5 and 7 universal turret lathes.

Spindle speeds may be preselected at any time and shifted almost instantaneously by the single control lever. Operator need not divert his eyes from his work. Spindle speeds are indicated on a dial in conjunction with which is a chart indicating the cutting speeds for corresponding diameters of work.

Gears are shifted hydraulically, the only manual effort necessary being that of slightly depressing the control lever at one point in its motion.

Controllers Are Custom Built to Suit Motors

■ Raytheon Mfg. Co., Newton, Mass., has developed a multistep speed controller for alternating current motors, which makes it possible to vary motor speed by changing input voltage.

This method of speed control permits operating motor by thermostat

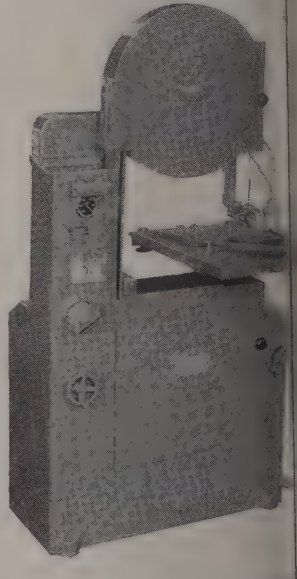
or automatic switch, because it insures restarting of motor regardless of controller setting. It has no moving parts. Controllers are custom built to suit motors and are sold only in quantity lots. Meth-

od of mounting is selected customer's needs, and an method of voltage contr nished.

Die Saw Constructi Is Arc Welded Stee

■ Tannewitz Works, Gran Mich., has added to its Model 24M Di-Saw, a ma continuous sawing and shapes, contours, etc., in and nonferrous metals, tool steels and chromium

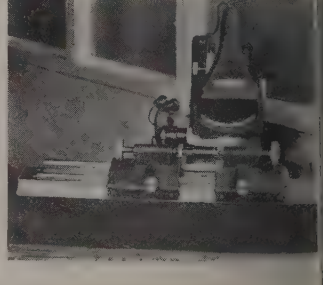
Chain files of exception lengths and various sizes an may be used for both in outside work. Standard e includes a conventional t welder for joining blades inch wide. When operato



to saw inside contours, bla be cut, slipped through th welded, ground off, and then back over the drive wheels.

Screw Lead Indicato With 2000:1 Visual

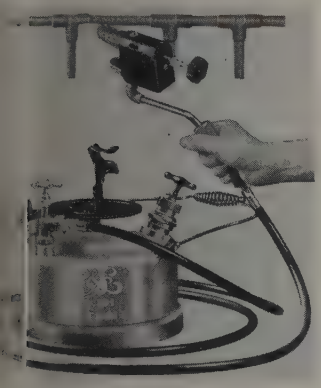
■ Sheffield Gage Corp., Day is offering a Lead Testing m incorporating a frictionless mechanism. This gage acc compares the lead interval of and worm threads against a block setting. Visual gage



a reed mechanism, ampli-
placement of contact point
1. Lowering of contact
screw thread and complete
positioning are accomplished
enient hand knobs. The
rying centers ride on pre-
lls in V-grooves and lock
pect to each other so that
nd work become, in effect,
slide.

ber's Combination
n Close Quarters

n & Lambert Mfg. Co., De-
s announced a combination
particularly adapted for
fittings in residential
g and heating. Burner is of
construction with a vein
newable jet block and re-
e cleaner pin. Flame is



inted and at reduced flame
s ⅝-inch in diameter by
es long. When opened wide,
⅝-inch in diameter and 5
ong. Ten feet of flexible
hose connect burner to tank
a shut-off valve. Tank is
tinned inside and out to pre-
rosion. It also has a pump,
l-shaped filler opening with
on filler plug, and a bracket
er when not in use. Tank
e gallon of gasoline, enough
8 hours at full flame and
onately longer at reduced

Capacity Circuit
ers Are Announced

inghouse Electric & Mfg.
t Pittsburgh, Pa., has added
ne new air circuit breakers
have twice the current-carry-
acity of previous breakers
ame dimensions.
breakers are capable of in-
ng peak currents of more
0,000 amperes at voltages
0 to 600. Their design in-
interrupting devices that
e formation of arc flames
es during operation. Other
changes include a new type of de-ionizing arc interrupter for either alternating or direct current.

Plug Gages In Ten-Thousandths of an Inch

■ Grobet File Corp. of America, New York, which last year introduced its line of high-speed steel flat drills for the piercing of small holes, announces its new line of cylindrical plug gages for checking these holes. Gages are high carbon tool steel, hardened, ground, and precision lapped and are immediately available from 0.010 to 0.084-inch, in thousandths of an inch. They also can be obtained in every 0.0005, 0.00025 or 0.0001 of an inch from 0.004 to 0.150-inch diameters. To check tolerances, double-end gages are offered.

Universal Thread Grinder

■ The announcement last week of the universal thread grinder by Jones & Lamson Machine Co., Springfield, Vt., gave the impression that grinding wheel spindle speed changes are made through sliding gears. The work spindle speed changes are made in this manner, but grinding wheel spindle speeds are regulated by a direct current motor and rheostat.

TO STAND UP UNDER PRESSURE
STEEL PICKS PENOLA
With a pressure of 5,000 pounds per square inch crushing down on a $10,000 roll neck bearing, a steel man can't afford to take any chances. He must have an extreme-pressure lubricant that he can depend on to do a consistent job of gear-protection, no matter how tough the going is. So he specifies Penola!
These two facts tell a powerful, convincing lubrication story:
• Over 80% of all roll neck bearings in 4-high mills are Penola-lubricated.
• Penola makes and sells more steel mill lubricants than any other maker in the world.
PENOLA LUBRICANTS
Penola Inc., Pittsburgh, Pa.
(Formerly Pennsylvania Lubricating Co.)
New York • Chicago • Detroit • St. Louis
LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885

Plant Weldery

(*Concluded from Page* 69)

This is principally one for detail and appearance, insuring against the need for additional work after cleaning and painting.

An incentive system of wage payment has been used in this shop for the past 20 years. That it has given satisfaction is indicated by the entire absence of friction between the workers and management and by the complete failuer of a number of professional agitators.

The arc welding section is organized on the group system. Men doing similar or consecutive operations are banded into a group under a group leader.

First operation in preparing parts is cutting to size and shape. Efforts to obtain maximum use of the material, with minimum scrappage, must center at this stage. Fig. 2 shows layouts to reduce material requirements.

Templates Save Labor

Templates are probably the greatest labor savers that can be used in the preparation of component parts. Marking for cutting or punching is often reduced by 50 to 80

Weld testing is necessa sure a high standard of and to further the develop improvement of contribu tors.

Testing of materials incl metal to be welded and posited. Hence material made of all plate stocks as rive in the plant. Testing trodes is done by the weld neer, using the nick-break downhand types and the fillet weld test for the fille position types. A continu gram of developmental t essential if the maximur tages are to be realized fr ing.

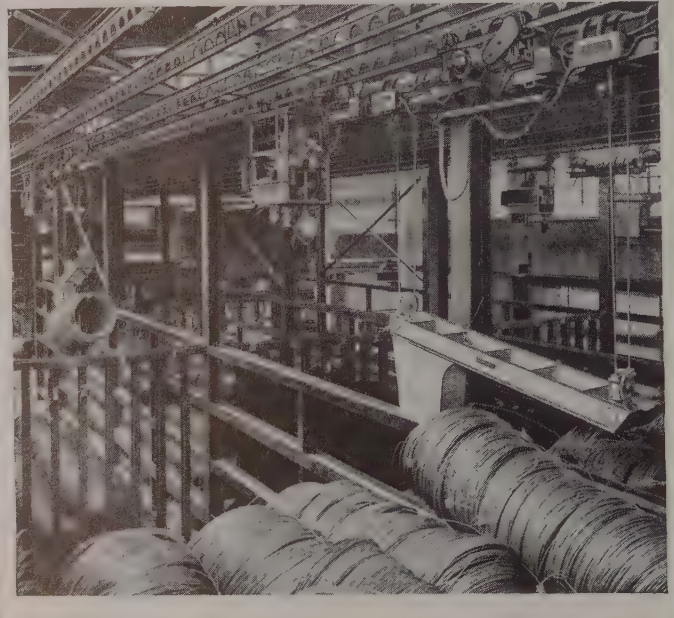
Accurate cost data in the possible form is essentia should be available on wh values can be traced clear operator, and the men s encouraged to question a not clear.

Estimating Similar

Estimating methods, li neering and other forms work, have not been chan ically by the introduction welding. If more than on ment can reasonably do a eration, both get a chance ticularly borderline jobs. mate moves in the same m the job does, first to mate aration sections, then thro chining and final assembly with each cost control ma ing the same part of the that his division will do on Material requirements are into the estimate and wei culated but not priced ur embodied into the final which is made by the cos office staff from the data by their shop representativ

CLEVELAND TRAMRAIL

OVER HEAD HANDLING EQUIPMENT IN THE ROD AND WIRE MILL



● Picking up 3400 pounds of rod per trip, transporting it to and accurately spotting the load in storage or gondola cars via Cleveland Tramrail.

● Other types of Cleveland Tramrail equipment for all departments of the rod and wire mill.

ALSO BUILDERS OF CLEVELAND CRANES ALL WELDED

CLEVELAND TRAMRAIL

DIVISION OF

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO.

Or Consult Your Phone Directory under Cleveland Tramrail

Statistics of Metals With Added Featur

■ *Metal Statistics;* cloth, 63 4 x 6 inches; published by A Metal Market, New York; by STEEL, Cleveland, for Europe by Penton Publish Ltd., Caxton House, West London S.W. 1.

It its thirty-second edit volume follows the style o issues in covering ferrous a ferrous statistics and misce economic subjects, with n additions and alterations.

New material includes a s tables on foreign and dome per production, deliveri stocks; copper refiners' bids 1 wire scrap; rolled steel pr for sale; monthly average p two grades of remelted alu

uded from Page 64)

anking press at the rate minute, thus maximum or production is 4320 punch- our from each line; that or blanks and 4320 stator his gives a total of 25,920 from this automatic press f course, in few plants a volume of laminations d. However, by employ- s numbers of laminations, size of lamination can be fairly wide range of mo- and ratings and therefore for a large number of

one size cookie disk is n these presses but the could be applied to vari- provided, of course, that rranted by sufficient vol- other sizes and jobs where ly small quantity of lami- required are made in the ous stamping section tor and stator slots are unched out slot by slot on indexing machines.

Pressure Feeding

licular interest in the auto- tallation is the pressure f rotor punchings through chutes as soon in Figs. 7 These guide chutes deliver ings to a point near the ching presses and permit hand transfer to the mag- the notching press. Also al feature of this layout specially constructed con- ich carries the pierced ro- chings to the automatic The conveyor carries the s, maintaining them on an be seen in Fig. 11 which livery end of the conveyor. laminations after being o to a machine where they ed together to form a com- tor stator core. After riv- y are placed in a housing by rolling a sheet of heavy a tube into which the core t. The assembly then is forming a one-piece unit hance of vibration or dislo- Welding of these stator is done in automatic nt at a high rate of speed. en is ready to receive the

ul Discussion of Future Offers

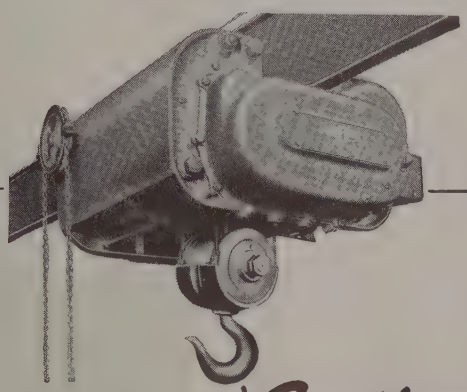
nd Your Money, by C. Don- as; cloth, 85 pages, 5½ x es; published by Prentice- w York; supplied by STEEL, d. for $1.50; in Europe by Publishing Co. Ltd., Caxton Westminster, London S. W. 1. s brief volume the author costructively discusses in clear, terse and simple language the economic and social questions that are rocking society today.

Its text is that our economic machine has been erected on the six basic ideas which the Declaration of Independence sought to provide and preserve; Self interest, individual initiative; private property, freedom of contract, equal opportunity and competition. Passage of time and new conditions have developed some changes in the foundation on which the machine was originally.

In this age of change when the State is set above the individual in so many lands, with America almost the only nation where individualism remains in force, this book sounds a note of cheer and encouragement, especially for the young, who are seeking to carve out their destiny.

The author outlines the present situation and discusses capitalism and communism, capital and labor, labor relations in England and Sweden, investments and investing, real estate, taxes and the struggle for security.

This is the third edition of this study, revised and much enlarged to bring it up to the present moment.



"Accurate Spotting" requires a
HAND-GEARED TROLLEY TYPE
A-E-CO LO-HED HOIST

When—1. The haul is short and load heavy or awkward. 2. The load must be accurately spotted, regardless of weight. 3. The load, because of its nature, must be carefully moved (chemicals, hot foundry ladles, etc.)—

The *hand-geared trolley type* A-E-CO Lo-Hed hoist—the one operated by a chain is the logical choice.

For high-lights of this hoist see A-E-CO POINTS (below). For full details of Lo-Hed hoists, send for our new catalog today.

AE CO POINTS

- Available in capacities from ½ to 6 tons.
- Operates on Standard I-beam or track of any make.
- Low headroom—stacks materials higher than any other hoist.
- Safe, fool-proof.
- Compact, strong, simply constructed.
- Protected against dust, moisture, fumes.
- Heavy duty, ball-bearing HOIST MOTOR.
- Automatic lowering brake.
- Ball or roller bearings at vital points.
- Improved plow-steel cable.
- 100% positive automatic stop.
- Efficient spur-gear drive . . . and

LO-HED COSTS LESS PER LIFT

OTHER A-E-CO PRODUCTS: Taylor Stokers, Marine Deck Auxiliaries, Hele-Shaw Fluid Power.

A-E-CO Lo-Hed HOISTS

AMERICAN ENGINEERING COMPANY

2484 ARAMINGO AVENUE, PHILADELPHIA, PA.

Suggests Tool Steels Be Narrowed to Fewer Types

■ TEN years of progress in tool steels and cutting materials were reviewed and highlighted by A. H. d'Arcambal, consulting metallurgist and sales manager of the small tools division, Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., speaking before the monthly meeting of the Detroit chapter of American Society for Metals, April 10.

Enumerating the various types of tool steels now in use, the speaker deplored the flood of new varieties which has been introduced in recent years, and said it was difficult for the metallurgist to keep up with the many new analyses perfected. He urged co-operative action by producers to narrow the field to a few types of steels.

Citing results achieved in the Pratt & Whitney plant, Mr. d'Arcambal stressed the advantages of the 18-4-2-high-speed steel for milling cutters, broaches, lathe tools, etc., used in machining alloy steels for aircraft parts ranging between 300 and 430 brinell in hardness. He also displayed cutters of high-carbon high-chrome steel used in metal lathe manufacture where tolerances on cutter thickness are of the order of 0.0002-inch.

Considering the hardening of tool steels, Mr. d'Arcambal complimented furnace builders on progress made in the last decade in furnace designs and atmosphere control. He further detailed a drawing technique adopted in his plant which is interesting. To prevent sticking of lead to threads of taps, the parts are first dipped in lead at 1100 degrees Fahr., then quenched in brine and then into lead again at 1400 degrees and a final quench in brine. The predipping and quenching forms a brine coating on the threads which prevents lead from adhering in the second dip.

New Nitriding Treatment

Perfection of a new surface hardening treatment of the nitriding type for tools, now in general use among tool suppliers, has resulted in substantially longer life on certain classes of tools such as reamers and taps. So successful has this treatment been, the speaker asserted, that it has superseded chromium plating of these tools.

A new cutting steel containing 1 per cent carbon, 5 chromium, 1 molybdenum and 1 vanadium, was mentioned as being an economical variety for efficient service on slitters and shears. Price is about one half that of high-speed steel.

Mr. d'Arcambal stated that research workers in his field have been looking for a satisfactory type of wear testing machine for about 20 years, and have yet to discover one. He indicated that such a machine would be a valuable addition to testing facilities, and his company is now in process of developing a new wear tester which it is hoped may answer the need.

Commenting on gages, the speaker showed a boron carbide plug gage which gave far better wear than even carbide tipped gages, the only adverse factor being its exceptional brittleness. Despite the latter quality, however, the boron carbide gage is proving to be most acceptable on certain gaging operations where proper care is taken to avoid fracturing it.

Germany, Italy Face Raw Materials Problem

(*Concluded from Page 27*)

to have produced 3,000,000 tons, compared with 1,900,000 tons in 1937, 1,000,000 tons in 1936, and 500,000 tons in 1934.

Ore in Scattered Deposits

Germany itself has no really large and rich ore deposits within its boundaries, but has intensively developed many scattered bodies of low and medium grade ores. Most extensive deposits are in the East Rhine, Weser and Thuringia districts. The outstanding source is the Seigerland district in the East Rhine region, where the ore, occurring in veins, is a carbonate with 38 to 40 per cent iron content and 6 to 8 per cent manganese. Weser and Thuringia ores are low grade and require roasting.

The Hermann Goering steelworks, started in 1937, are designed to work the low grade Salzgitter ore and also those of southern Germany. Grandiose plans have been advanced to raise the domestic output to 20,000,000 or 30,000,000 tons within the next few years.

While admiring Germany's progress toward technological self-sufficiency, geologists and economic experts still believe Germany must continue to look to outside sources for a large portion of ore requirements.

Prof. Edward Sampson, Princeton university geologist, says: "Germany's own iron ore resources are hopelessly inadequate . . . Rigorous economy and re-use of scrap iron, combined with stockpiling of scrap iron, might suffice for military needs. If Germany were cut off from French and Swedish supplies, her situation would be difficult in a long war.

"It would seem," Professor Sampson continues, "Germany is by no means ready to undertake a protracted war, and indeed has probably not gathered sufficient supplies to support her full man power in a short war against a ma

Germany's improvem mineral resources since ever, has been more than any other major po ing Russia. Professor S lustrates this progress lowing table:

	Relative ratings on basis Germany = 10	
	1929	1936
Germany	100	100
United States	480	355
British Empire	295	265
U.S.S.R.	55	112
France and possessions	110	75
France	80	55
United Kingdom	65	55
Japan and possessions	20	35
Italy	20	20
Spain	25	10
Poland	15	10

Italy, the other powe share Spain's mineral has only small reserves o mainly on the island Another source of iron is which was inefficiently ancient forges and disca is found in large quantitie ly near Piombino, oppo and contains up to 50 per

In 1938, Italy increase imports 92.04 per cent metric tons. Italy also about 600,000 tons of scr crease of nearly 13 per 1937. Scrap is the princip raw material import of

Italy Low On Fu

Italy lacks not only iron ore reserves, but als is a small pig iron prod year's pig iron production 000 tons, higher than t tons produced in 1929. St tion in 1938 totaled 2,33

Italy's and Germany's Spain's surplus mineral depends on General Fran ence to the Rome-Berlin observers doubt the tie ence, although it is beli and Germany will mai mendous pressure on Fra understood Germany ma to the Spanish ore deposi the conditions for support

Aluminum in Figh Against Silicosis

■ How fine aluminum dust with dust containing trace to combat silicosis is descr pamphlet. "Aluminum and by R. C. Emmons and Car the University of Wiscons ment of Geology. Copies had from "American Min published by U. S. Geolo vey, Washington, D. C.

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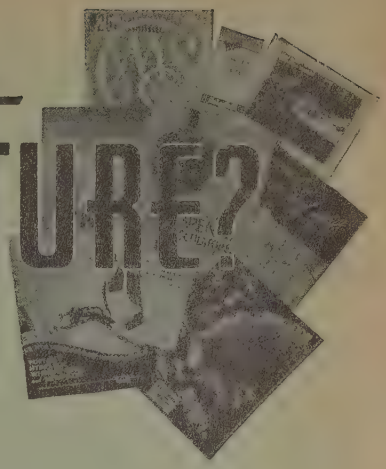

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Heads

Machine Co.—12-page il-bulletin No. F-80-3. Hard-ground die heads of three pecially recommended for work where fine accuracy imum production are im-e fully described. Full speci-diagrams of clearances and information are given.

tors

almers Manufacturing Co. illustrated bulletin No. 1196. Machine Tools Earn Their ows applications of motors ne tools. Illustrations show installations. Advantages of o-Maintenance" motors are

tal Spinning

kee Metal Spinning Co.—ustrated filable bulletin No. cribes the art of metal spin-shows seven successive stages g an aluminum cover. Shop l step by step explanation

(5)—Air Equipment

Galland-Henning Mfg. Co.—4-page illustrated folder on "Nopak" valves and air cylinders. "Nopak" air valves of various types and cushioned air cylinders for industrial applications are described. A table of air losses compared to leaks at various pressures is included. Structural features of the equipment are shown.

(6)—Stack-Cutting

The Linde Air Products Co.—8 page illustrated booklet. How large quantities of simple or intricate shapes are produced from piled sheets or plates of steel by oxy-acetylene cutting process is described. Increased production, greater uniformity of shape-cut parts and lower unit costs are advantages.

(7)—High Speed Press

The V. & O. Press Co., Inc.—6 page illustrated bulletin No. 2HS-39. Announcement of new high speed blanking press which is said to be extremely accurate, rigid and fast, and to have complete accessibility. Uses standard dies. Complete specifications are included.

(8)—Broaches

American Broach & Machine Co.—32-page illustrated catalog No. 139. American broaches and broaching machine tool set-ups are illustrated and described. Engineering tables, specifications and a section on care and maintenance of broaches are included.

(9)—Milling Machine

Fray-Mershon, Inc.—8-page illustrated bulletin. A new full universal, high speed, milling attachment for all horizontal mills is announced and described. Attachment does not need to be taken off when mill is to be used for any other operation. Unit is self contained. Full information and specifications are included.

(10)—Tap Drill Gauge

Dayton Rogers Manufacturing Co.—Pocket size time saver disc giving correct size of tap drills for U. S. gauge screw threads and decimal equivalent chart. Made of grease and oil resisting material for long life. Complete list of tap drill sizes for National Pipe thread standards is also included.

(11)—Air Equipment

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Wheelco Instruments Co.—62-page illustrated loose leaf type catalog on temperature control, indicating and safety instruments. Numerous units for industrial applications together with accessories and installation information are described.

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(14)—Indicating Gauges

The Foxboro Co.—8-page illustrated bulletin No. 229. Explains functions and advantages of Foxboro gauges where pressure is an important factor. Cross-sectional illustration outlines movement of the Model "P" gauges. Specifications for various gauges are given. Accessories available to adapt gauges to any application are covered.

(15)—V-Belt Drives

T. B. Wood's Sons Co.—56-page illustrated catalog No. 182. Advantages, uses, general information, specifications and price lists of V-belt drives and sheaves are covered in this catalog. Information on selection of V-belt drives using stock sheaves is given. Engineering data and tables complete the book.

(16)—Forgings

The Steel Improvement & Forge Co. —34 page illustrated booklet "Forging Ahead With Forgings." The design, use and applications of forgings are covered, and various types of forgings are explained. Production views show various steps in the making of forgings in this company's plant.

(17)—Filters

The Cuno Engineering Corp. — 24 page illustrated booklet "80 Ways to Make More Money." Describes use of filters in numerous industries and processes, and for handling many kinds of liquids. Conveniently thumb-indexed.

(18)—Automatic Filter

S. F. Bowser & Co., Inc.—4 page illustrated bulletin No. 5922. The figure 822 self-cleaning automatic filter for lubricating oils and other liquids is described and complete specifications given. Greatly increased filtration area per square foot is provided. Five sizes are available.

(19)—Welding

Progressive Welder Co.—8-page illustrated bulletin No. 3902. Portable hydraulic welding equipment for production welding, and a brief summary of a few of more than 250 portable welding gun types are described. Hydraulic punching and stripping units are also described.

(20)—Wire Rope

A. Leschen & Sons Rope Co.—44-page illustrated pocket size booklet "Practical Information on the Use and Care of Wire Rope", Fourth Edition. A cross-indexed handbook describing recommended methods and practices in the use and care of wire rope.

(21)—D. C. Mill Motors

Harnischfeger Corp.—4 page illustrated filable folder, Bulletin No. C-4. P. & H. heavy duty D. C. mill motors with full number of interpoles for all ratings are described and illustrated with a large sectional photograph. Important features are detailed.

(22)—Rotary Shears

The Quickwork Co.—4 page illustrated bulletin. Rotary shears with capacities up to 1 inch thick mild steel and with throat depths up to 60 inches are described. Stamping trimmers and power hammers are also covered.

(23)—Welding

A. M. Byers Co.—16 page illustrated bulletin No. 2-39. The welding of wrought iron is fully discussed and described. Various types of welding is included. Physical properties of welds in wrought iron are discussed.

(24)—Industrial Lighti

General Electric Co.—4 lustrated book "Lighting f tion in the Factory", N. This bulletin discusses th lighting problem in terms knowledge of seeing. It in lighting suggestions that sho helpful to every factory ma terior and exterior lighting sidered.

(25)—Refractories

Harbison-Walker Refractor 6-page illustrated folder. Des fractories manufactured by pany in the South. HWRC high heat duty firecla WYLAM, moderate heat du brick and STAR silica brick as bonding morters are cov ommended uses and location house stocks are covered.

(26)—High Speed Steel

Crucible Steel Company ica.—8 page folder describi grades of Rex high speed st information on characteristi ing and hardening instruct advantages of the 7 grades a A complete list of branch o warehouses is included.

(27)—Electric Switches

Micro Switch Corp.—4-p trated bulletin No. 18A. De eration and application o Switches for industrial ap are shown. Numerous typic cations are pictured. These operate in any position and proved by Underwriter's Lab

(28)—Drilling and Borir

W. F. & John Barnes—8 lustrated bulletin No. 912. standard vertical drilling an machine with wide adapta fully described. Typical set- specifications are covered.

(29)—Presses and Shear

Niagara Machine & Tool 12-page illustrated folder. A resume of the complete line Niagara presses, shears and for sheet metal and plate wo teen sizes and types are sho

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Markets Tending Downward Slowly

Sentiment Affected More Than Demand; Shape Orders Heavier

MARKET IN TABLOID ★

Demand
Generally downward; tin plate, structurals more active.

Prices
Fairly steady; scrap composite at new low for year.

Production
Down 2 points to 51½ per cent.

RDING factors weigh most heavily among the ends in steel markets, resulting in moderate demand and production.

ss actually makes a better showing than is by the abrupt weakening of sentiment the weeks. This leads producers to believe that nward trend apparently in store for activity 30 to 60 days will be gradual, rather than Steelmaking the past week was down 2 points per cent, matching the previous low for 1939 but comparing with 32 per cent a year ago.

t for automotive demand, the decline in fin- eel orders lately has been small. In some dis- ttle change is shown compared with the vol- the last six months. Automobile assemblies t to fulfill recent predictions of a major re- but parts manufacturing has tapered and little al steel buying for remaining production of dels is in sight.

nterest, planning introduction of 1940 models summer, has placed some small steel orders liminary work on the new cars. However, her makers are not expected to offer new until late summer or early fall.

car assemblies last week again increased about its to 88,050, fourth best week for the year and nearly 45 per cent larger than a year ago. Motors accounted for most of the gain, boost- ut from 32,735 units to 34,680. Chrysler ex- from 20,525 to 20,725, but Ford held at 22,230 others dropped from 11,529 to 10,415.

g Steel Awards

quiries In Spurt

me products the letdown in demand lately is ident in size of orders than in number, re- the tendency of consumers to restrict stocks. y offsetting the quieter market for commoner ades are gradual improvement in tin plate speci- and a bulge in activity in structural shape crete reinforcing bar markets.

tural awards last week were heavy, nearly 20,- s being involved in eight major projects alone. l items included 4370 tons for TVA trans- towers, 4200 tons for a Chicago school, 3700 tons for a hospital, Brentwood, N. Y., and 3000 tons for a Boston sewer. Among inquiries are 6000 tons for dam towers in California, 4000 tons for a viaduct, Kansas City, Mo., 3700 tons for convention and music halls, Buffalo, and 3000 tons for Southern Pacific railroad bridges in California.

Outstanding in concrete bar inquiries are 9000 tons for government buildings, Washington, and 4200 tons for a bridge and courthouse, Seattle. Bar awards are headed by 3000 tons for the East river drive, New York.

Rail Bookings Past Six Months Increase Sharply

Except for the recent order of the Missouri Pacific for 1150 freight cars, railroad equipment buying still is light. Only a few of the larger roads have yet to place 1939 rail needs, and prospects for secondary buying later in the year are indefinite. However, rail purchases the past six months were nearly 85 per cent larger than one year previous, and orders for both track material and freight cars during this period showed a larger gain compared with a year ago than did steel ingot production.

Last week's decline in steelmaking was sharpest in districts affected mostly by automotive tonnage. Detroit operations were down 10 points to 59 per cent and Cleveland slumped 13 points to 39½. Other recessions included 4 points to 45 at Pittsburgh, 5 points to 43 at Youngstown, 2 points to 60 at Birmingham and 1 point to 65 at Wheeling.

Cincinnati increased 7 points to 51 and St. Louis was up 2½ to 44½. Unchanged districts were eastern Pennsylvania at 40, Chicago at 53½, Buffalo at 44½ and New England at 35.

Scrap prices have weakened further in most areas, influenced by the less favorable outlook for steelmaking. Reductions at Chicago and Pittsburgh lower the scrap composite 58 cents to $14.46, lowest since last November. The finished steel composite is unchanged at $56.50. While there are scattered reports of shading, steel prices generally are steady.

COMPOSITE MARKET AVERAGES

	Apr. 15	Apr. 8	Apr. 1	One Month Ago Mar., 1939	Three Months Ago Jan., 1939	One Year Ago Apr., 1938	Y A
Iron and Steel	$36.32	$36.40	$36.42	$36.40	$36.36	$38.61	
Finished Steel	56.50	56.50	56.50	56.50	56.50	61.70	
Steelworks Scrap..	14.46	15.04	15.04	14.98	14.77	12.30	

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, ba pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, sha hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Y

Finished Material

	April 15, 1939	March 1939	Jan. 1939	April 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.765
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.45
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	April 15, 1939	March 1939	Jan. 1939
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.3
Basic, Valley	20.50	20.50	20.5
Basic, eastern, del. Philadelphia	22.34	22.34	22.3
No. 2 foundry, Pittsburgh	22.21	22.21	22.2
No. 2 foundry, Chicago	21.00	21.00	21.0
Southern No. 2, Birmingham	17.38	17.38	17.3
Southern No. 2, del. Cincinnati	20.89	20.89	20.8
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.2
Malleable, Valley	21.00	21.00	21.0
Malleable, Chicago	21.00	21.00	21.0
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.3
Gray forge, del. Pittsburgh	21.17	21.17	21.1
Ferromanganese, del. Pittsburgh	85.33	85.27	90.2

Scrap

Heavy melting steel, Pittsburgh	$15.25	$15.75	$15
Heavy melt. steel, No. 2, E. Pa.	13.75	13.375	13.
Heavy melting steel, Chicago	12.75	14.25	13.
Rails for rolling, Chicago	17.25	17.25	17.
Railroad steel specialties, Chicago	14.75	16.25	16.

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.
Connellsville, foundry, ovens	5.00	5.00	5.
Chicago, by-product fdry., del.	10.50	10.50	10.

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold strp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	
Gulf ports	
Birmingham	
St. Louis, del.	
Pacific Coast points	

Tin and Terne

Tin Plate, Coke (bas

Pittsburgh, Gary, Chica	
Granite City, Ill.	

Mfg. Terne Plate (ba

Pittsburgh, Gary, Chica	
Granite City, Ill.	

Bars

Soft Steel

(Base, 3 to 25 ton

Pittsburgh	
Chicago or Gary	
Duluth	
Birmingham	
Cleveland	
Buffalo	
Detroit, delivered	
Philadelphia, del.	
Boston, delivered	
New York, del.	
Gulf ports	
Pacific Coast points	

Rail Steel

To Manufacturing

Pittsburgh	
Chicago or Gary	
Detroit, delivered	
Cleveland	

.....	2.10c
.....	2.10c
.....	2.45c
t points	2.70c
Iron	
erre Haute...	2.15c
a	2.47c
refined....3.50-8.00c	
teinforcing	
t, straight lengths, by distributors	
Gary, Buffalo	
irm., Young.,	
Pt., Pitts....	2.05c
livered	2.15c
.....	2.40c
st ports.....	2.50c
a, del.	2.22c
t, straight lengths, by distributors	
Gary, Chi-	
iffalo, Cleve-	
rmingham....	1.90c
ivered	2.00c
.....	2.25c
st	2.35c

oducts

-Chicago-Birm. base	
b. keg in carloads	
ire nails	$2.45
ted nails	$2.45
Per pound)	
aples	3.15c
staples	3.40c
d wire, stand-	
gage two-	
; 80-rod spool	
b-point cattle,	
ool.....	$2.62
ence wire....	2.95c
wire	3.35c
fencing (base	
umn)	67.00
p bale ties,	
.. column)...	56.00

ufacturing Trade

- Cleve. - Chicago- am (except spring wire)

basic wire..	2.60c
wire	2.65c
.....	3.20c

Mass., $2 higher on sic and spring wire. C. L. Pitts. on all extras) $3.60

nished Bars

	Carbon	Alloy
....	2.70c	3.40c
....	2.70c	3.40c
....	2.70c	3.40c
....	2.75c	*3.50c
....	2.70c	3.40c
....	2.70c	3.40c

d.

ars (Hot)

, 3 to 25 tons)

Buffalo, Chi-	
ssillon, Can-	
lehem	2.80c
ivered	2.90c

loy	Alloy	
iff.	S.A.E.	Diff.
.35	3100.....	0.70
.75	3200.....	1.35
55	3300.....	3.80
.25	3400.....	3.20
0.25 Mo.....		0.55
0.30 Mo. 1.50-		
.....		1.10
10 Cr.		0.45
ring flats		0.15
.....		1.20
flats		0.85
.....		1.50
.....		0.85
flats		0.15
rounds, squares		0.40
urnace up 50 cents.		

Buffalo....	2.40c
.....	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham....	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm...	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50.....	2.95c
0.51—0.75.....	4.30c
0.76—1.00.....	6.15c
Over 1.00.....	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill.....	$40.00
Relay rails, Pittsburgh 20—100 lbs. 32.50-35.50	
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality..	39.00

Cents per pound

Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller.....68.5 off	
Do. larger, to 1-in.....66 off	
Do. 1⅛ and larger.....64 off	
Tire bolts .....52.5 off	

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .....60 off	
Elevator bolts .....60 off	
Plow bolts .....68.5 off	

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less..	67	70
⅞—1-inch	64	65
1⅛ and larger..	62	62

Hexagon Cap Screws

Upset, 1-in., smaller.....67.5 off

Square Head Set Screws

Upset, 1-in., smaller.....75.0 off	
Headless set screws.....70.0 off	

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago ...	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.....65-10 off	
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld		67½
2, lap weld		60
2½ to 3, lap weld		63
3½ to 6, lap weld		65
7 and 8, lap weld		64
10-inch lap weld		63½
12-inch, lap weld		62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld..	27½	14
9 to 12 lap weld...	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..	$42.00-43.00
4-in., Birmingham..	45.00-46.00
4-in., Chicago.....	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point..	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo...	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago..	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 47/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur..	$3.75
Connellsville, fdry..	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry....	6.50- 6.75
Wise county fdry...	5.50- 5.75
Wise county fur....	4.50- 4.75

By-Product Foundry

Newark, N. J., del...	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens..	10.50
New England, del...	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens.	7.00
Indianapolis, del....	10.00
Cincinnati, del.....	9.75
Cleveland, del.....	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del...	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol...	16.00c
Toluol, two degree.....	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia....$28.00	

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Bas
St. Louis, northern	21.50	21.50	21
St. Louis from Birmingham	†21.12	.....	20
St. Paul from Duluth	23.63	23.63	.

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Stanc $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	
Pitts. dist. fur.	20.50	do., del Chicago	
		Lyles, Tenn.	

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as fo plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilico $1 per ton add. Each unit over 3%, add $1 per to

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$60.80
First Quality	
Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50
Second Quality	
Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00
Ohio	
First quality	39.90
Intermediate	36.10
Second quality	31.35
Malleable Bung Brick	
All bases	$56.05
Silica Brick	
Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - bur grains, net ton f Chester, Pa., and timore bases (bag

Do. domestic

Do., f.o.b. Chewe

Wash., net ton, bu net ton, bags

Quickset magnes grains, f.o.b. Ch lah, Wash., net bulk

Basic Brick

Net ton, f.o.b. Balt mouth Meeting, Ch

Chrome brick

Chem. bonded chrom

Magnesite brick

Chem. bonded magne

Fluorspar, 85-

Washed gravel, paid, tide, net ton

Washed gravel, f.o.b. Ky., net ton, carlo all rail $17, barge

No. 2 lump

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.65-1.70

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

chrome	16.50c
Do., ton lots	17.25c
Do., less-ton lots	17.75c

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, ⅛-in., lb.
Do, 2%
Spot ¼c hig

Silicon Briquets, cont carloads freight lowed, ton
Carload, spot
Less-ton lots, lb.

Manganese Briqu contract carloa bulk freight allo lb.
Ton lots
Less-ton lots
Spot ¼c hig

Zirconium Alloy, 12-1 contract, carlo gross ton
Do, spot
34-40%, contract, loads, lb., alloy
Do, ton lots
Do, less-ton lots
Spot ¼c hig

Molybdenum Pow 99%, f.o.b. York, 200-lb. kegs, lb.
Do, 100-200 lb.
Do, under 100-lb.

Molybdenum O Briquets, 48-52% lybdenum, per po contained, f.o.b. ducers' plant

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24
.....	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.61
(Metropolitan)...	3.94	4.11	4.11	3.76	3.75	5.56	3.40	4.60	4.50
a	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.33
.....	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
.....	4.00	4.15	....	3.85	3.85	5.20	3.90	....	5.40
.....	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
.....	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
.....	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
.....	3.43	3.58	3.83	3.75	3.80	5.42	3.58	4.65	4.74
.....	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
.....	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
.....	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
.....	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
.....	3.72	3.87	3.87	3.47	3.47	5.07	3.53	4.47	4.53
y	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
.....	4.00	4.15	4.15	3.95	3.95	5.71	3.90	....	5.25
a	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
a.	4.64	4.79	4.79	4.41	4.41	6.01	4.47	....	5.47
n, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
ns	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
.....	4.30	4.50	5.85	4.05	4.15	5.90	3.95	....	5.25
Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
's	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
isco	3.65	4.05	6.00	3.60	3.60	5.20	3.60	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
.....	3.61	4.18	4.28	7.65	6.25	6.00	8.05	8.73	7.33
.....	3.66	4.14	4.14	7.50	6.10	5.85	....	8.69	7.29
a	3.66	4.11	3.85	7.46	6.06	5.81	8.71	....	....
.....	....	4.10	3.95	....	....	....	....	....	....
a.	....	4.20	....	....	....	....	....	....	....
.....	3.57	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
.....	3.35	3.70	3.80	7.35	5.95	5.70	7.75	8.35	6.95
.....	3.35	3.80	3.70	7.45	6.05	6.05	7.85	8.25	6.85
.....	3.55	3.85	3.58	7.57	6.17	5.92	7.39	8.55	7.15
.....	3.60	4.05	3.90	7.59	6.19	5.94	8.99	8.60	7.20
.....	3.65	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
s	....	4.39	4.00	7.60	6.20	8.79	9.34	8.94	7.54
.....	....	3.93	3.93	7.48	6.08	5.83	7.88	8.48	7.08
.....	3.76	4.07	3.92	7.62	6.22	5.97	8.02	8.62	7.22
y	4.46	4.60	....	....	....	....	....	....	....
.....	....	4.61	....	....	....	....	....	....	....
a	....	4.44	....	....	....	....	....	....	....
a	....	4.84	....	....	....	....	....	....	....
m, Ala.	....	4.73	....	....	....	....	....	....	....
ns	5.00	5.10	....	....	....	....	....	....	....
.....	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
es	4.45	6.50	4.65	9.40	8.55	8.40	9.05	10.40	9.55
isco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

d on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, April 13

Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
-3.00 Si...	$23.45 5 0 0	$17.25	2 0 6
r.....	.....	16.40	1 18 6
os. .03-.05	26.97 5 15 0*	.....	.....
.....	$34.59 7 7 6	$38.34	4 10 0
.. 5 gage..	53.35 11 7 6	42.60	5 0 0
.....	$44.56 9 10 0	$48.99	5 15 0
s.....	2.30c 11 0 0	1.85c to 1.95c	4 15 0 to 5 0 0
pes.....	2.09c 10 0 0	1.85c to 1.90c	4 15 0 to 4 17 6
or 5 mm.	2.29c 10 18 9	2.10c to 2.34c	5 7 6 to 6 0 0
, 24 gage			
.....	2.72c 13 0 0	2.93c	7 10 0°
¼ ga., corr.	3.29c 15 15 0	3.61c	9 5 0
ips.....	2.77c 13 5 0	1.95c	5 0 0
se.....	4.08c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
re, basc..	4.86c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
ac.....	.....	2.73c to 2.93c	7 0 0 to 7 10 0
x 108 lbs.	$ 4.73 1 0 3	.....	.....

omanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5.	$23.22 4 19 0(a)	$16.44	620.50	$15.17	450	$25.26 63
Basic bess. pig iron..	21.69 4 12 6(a)	.....	...	.....	...	27.86(b) 69.50
Furnace coke.....	5.39 1 4 2	5.96	225	7.25	215	7.62 19
Billets.....	34.59 7 7 6	25.04	945	28.98	860	38.69 96.50
Standard rails.....	1.99c 9 10 0	1.56c	1,300	2.06c	1,375	2.38c 132
Merchant bars.....	2.42c 11 12 0††	1.44c	1,202	1.65c	1,100	1.98c 110
Structural shapes...	2.17c 10 8 0††	1.41c	1,173	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.....	2.29c 10 19 3††	1.82c	1,515	2.06c	1,375	2.29c 127
Sheets, black.....	3.08c 14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	3.61c 17 5 0	3.30c	2,750	4.13c	2,750	6.66c 370
Plain wire.....	4.08c 19 10 0	1.92c	1,600	2.48c	1,650	3.11c 173
Bands and strips...	2.58c 12 7 0††	1.71c	1,340	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers p.

HEAVY MELTING STEEL

Birmingham, No. 1.	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, N. 1	13.50-14.00
Buffalo, No. 2	11.50-12.00
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	11.00-11.50
Chicago, No. 2 auto	10.00-10.50
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	14.00-14.50
Cleveland, No. 2	13.00-13.50
Detroit, No. 1	10.50-11.00
Detroit, No. 2	9.00- 9.50
Detroit (industrial)	10.50-11.00
Eastern Pa., No. 1	15.50-16.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	11.75-12.25
Granite City, R. R.	11.50-12.00
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.25-16.75
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	14.00-14.50
St. Louis, R. R.	11.75-12.25
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	12.00
Seattle, No. 1	12.00
Toronto, dlrs. No. 1.	9.75-10.25
Valleys, No. 1	14.25-14.75

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	11.50-12.00
Chicago, dealer	10.75-11.25
Cincinnati, dealers	10.75-11.25
Cleveland	13.50-14.50
Detroit	11.50-12.00
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	9.50-10.00
Valleys	13.75-14.25

BUNDLED SHEETS

Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.50-11.00
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.00-14.50
St. Louis	7.00- 7.50
Toronto, dealers	8.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50- 8.00
Cincinnati, dealers	6.75- 7.25
Detroit	8.75- 9.25
†Los Angeles	3.75- 4.00
St. Louis	6.00- 6.50

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	11.25-11.75
Cincin., No. 1, deal.	8.25- 8.75
Cincinnati, No. 2	3.75- 4.25
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	10.50-11.00
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	4.25- 4.75

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	7.50- 8.00
Detroit	5.50- 6.00
Eastern Pa.	9.50-10.00
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.75-10.25
St. Louis	3.00- 3.50
Toronto, dealers	4.25- 4.75
Valleys	8.75- 9.25

SHOVELING TURNINGS

Buffalo	7.25- 8.00
Cleveland	8.00- 8.50
Chicago	7.50- 8.00
Detroit	6.50- 7.00
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.25
Cincinnati, dealers	3.25- 3.75
Cleveland	8.00- 8.50
Eastern Pa.	6.50- 7.00
Detroit	6.00- 6.50
New York	†2.50- 3.00
Pittsburgh	8.75- 9.00
Toronto, dealers	5.25- 5.75

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	12.50-13.00
East. Pa., elec. fur.	13.50
St. Louis	9.50-10.00
Toronto	4.50- 4.75

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†5.00
Buffalo	7.50- 8.00
Chicago	5.50- 6.00
Cincinnati, dealers	3.25- 3.75
Cleveland	8.00- 8.50
Detroit	6.00- 6.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	4.25- 4.75

RAILROAD SPECIALTIES

Chicago	14.50-15.00

ANGLE BARS—STEEL

Chicago	15.00-15.50
St. Louis	13.50-14.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.50-16.00
Chicago, leaf	15.00-15.50
Eastern Pa.	17.50-18.00
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.25-15.75
Chicago (2 ft.)	15.50-16.00
Cincinnati, dealers	16.50-17.00
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	12.50-13.00
Cleveland	17.00-17.50
Pittsburgh	17.00-17.50
St. Louis	13.00-13.50
Seattle	16.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.00-13.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	7.25- 7.75
Cincinnati, dealers	7.00- 7.50

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	12.00-12.50

FORGE FLASHINGS

Boston district	†8.50
Buffalo	11.50-12.00
Cleveland	11.50-12.00
Detroit	9.75-10.25
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	14.50-15.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†15.00
Chicago, net	17.50-18.00
Eastern Pa.	21.00-21.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	15.00-15.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†15.25-15.75
New York	
Eastern Pa.	
St. Louis, 1¼-3¾"	

CAR WHEELS

Birmingham	
Boston dist., iron	
Buffalo, steel	
Chicago, iron	
Chicago, rolled steel	
Cincin., iron, deal.	
Eastern Pa., iron	
Eastern Pa., steel	
Pittsburgh, iron	
Pittsburgh, steel	
St. Louis, iron	
St. Louis, iron	

NO. 1 CAST SCRAP

Birmingham	
Boston, No. 1 mach.	
N. Eng. del. No. 2	
N. Eng. del. textile	
Buffalo, cupola	
Buffalo, mach.	
Chicago, agri. net	
Chicago, auto net	
Chicago, railr'd net	
Chicago, mach. net	
Cincin., mach. deal.	
Cleveland, mach.	
Eastern Pa., cupola	
E. Pa., mixed yard	
Los Angeles, net	
Pittsburgh, cupola	
San Francisco, del.	
Seattle	
St. Louis, cupola	
St. Louis, agri. mach.	
St. L., No. 1 mach.	
Toronto, No. 1, mach., net	

HEAVY CAST

Boston dist. break.	
New England, del.	
Buffalo, break.	
Cleveland, break, net	
Detroit, auto net	
Detroit, break.	
Eastern Pa.	
Los Ang., auto, net	
New York, break.	
Pittsburgh, break	

STOVE PLATE

Birmingham	
Boston district	
Buffalo	
Chicago, net	
Cincinnati, dealers	
Detroit, net	
Eastern Pa.	
New York, fdy.	†1
St. Louis	
Toronto dealers, net	

MALLEABLE

Birmingham, R. R.	†1
New England, del.	1
Buffalo	1
Chicago, R. R.	1
Cincin., agri., deal.	1
Cleveland, rail	1
Eastern Pa., R. R.	1
Los Angeles	1
Pittsburgh, rail	1
St. Louis, R. R.	1

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	9.00- 9.50
Tungsten. sh. ton. unit, duty pd. nom.	20.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	

Manganese Or

Prices not including d per unit cargo

Caucasian, 50-52% nom.	
So. African, 50-52% nom.	
Indian, 49-50%	2

The Market Week—

eets, Strip

and Strip Prices, Pages 88, 89

urgh—Sheet production and continue to decline. New is well below output, and reduction in operations is Automotive releases are and additional buying to e assembly of 1939 models cted to be relatively small. dies of flat-rolled steel held motive interests are believed been underestimated con- y. Sheet mill schedules are below 55 per cent, with hot tput about 30 and cold strip Galvanizing operations are at 60 per cent.

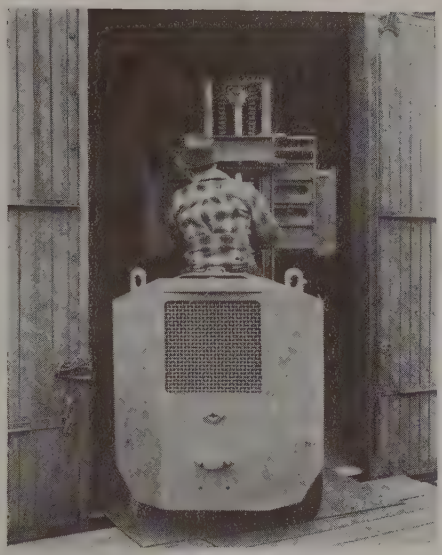
land—Sheet buying is slow- with little more than fill-in s in prospect from the auto- industry, no definite reversal ecent downward trend in de- s seen for this month. At e time, consumption among er of miscellaneous users is ustained, with makers of ld equipment holding to ctive schedules. Buying last in anticipation of new quan- erentials now effective tends pone placing of some busi- though this practice was not al. Prices remain to be thoroughly.

go—New business is un- and generally in small lots mediate needs. The outlook rtain, partly because of the tive situation. Heavier buy- Detroit interests is thought to appear until tonnage for odels is ordered in July or

n—Sheet buying is confined to fill-in needs, with current nts largely against old or- Demand by the building s less than expected, while rs, fabricators of small tanks dustrial consumers generally rking off stocks. Cold strip es slow, with prompt deliv- ked on most tonnage. Strip ave small backlogs and op- s are irregular at about 55 t in most instances. Demand tomobile parts makers con- to slacken.

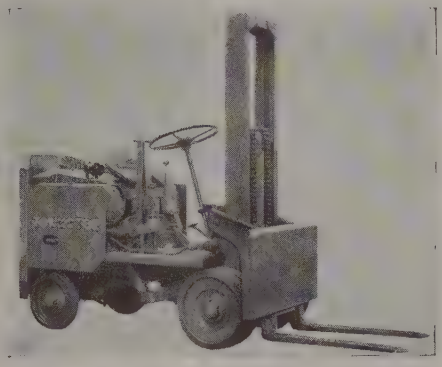
York — As for some time emand for narrow cold strip proved slightly during the vo weeks of April. Consum- a close-to-needs policy, have uying monthly requirements st ten days, purchasing cau- and little during the last each month. Shipments are eyed closely to incoming busi- s are operations, most eastern ers lacking backlogs. De-

CAR LOADERS?



NEW MODEL C-L, 47" WHEEL BASE, LOAD CAP. 4000 LBS.

Yes! WE'VE BEEN BUILDING THEM FOR 6 YRS.



STANDARD MODEL L, 56¼" WHEEL BASE, LOAD CAP. 6000 LBS.

Carloading is not new to TOWMOTOR. For over 20 years TOWMOTOR Tractors have been used to push and pull freight in and out of box cars. For 6 years TOWMOTOR Lift Trucks have been doing it. Now TOWMOTOR offers a still shorter and more condensed lift truck for carloading, as well as other handling operations. The new Model C-L has a shorter—47"—wheel base with load cap. of 4000 lbs. Built with single or telescopic mast. Equipped with forks, flat plate or ram. *All vital operating parts standard and interchangeable with other models.* No cheapening of construction—no reduction in size of vital operating parts. Just a shorter machine to turn in a smaller radius, operate in still closer quarters and still offering the lowest cost per ton moved. Write for new bulletin of action pictures today, explaining your requirements so we can send specifications on model best suited to your needs.

PIONEERS OF STRAIGHT GAS POWER AND SEATED CENTER CONTROL FOR 20 YEARS.

Towmotor Co., 1247 East 152nd St., Cleveland, Ohio.

New York Office: 92 Liberty St., Phone: REctor 2-3977
SALES OFFICES IN 22 PRINCIPAL CITIES

TOWMOTORS CLEVELAND

LIFT TRUCKS AND TRACTORS

mand from the automotive trade is notably dull.

Sheet buying is largely for early needs, with some consumers working on tonnage placed previously and ordering only small fill-in lots. This applies to manufacturers of refrigerators, metal doors and door bucks and air conditioning equipment. Makers of kitchen ware are tapering their output seasonally, while stove interests have built sufficient stocks to meet spring requirements and are buying little sheet tonnage. Total sheet business is about on a par with the last two weeks in March but is down from February and early-March levels.

Philadelphia—Business is spotty, with tonnage so far this month lighter than in March. Stove requirements are holding up surprisingly well, according to some sellers. Narrow strip demand is limited to small lots, but total volume is steady.

Buffalo—Sheet and strip demand has been without major change the past four weeks, although a seasonal upturn had been expected by this time. Automotive orders have been below expectations, but miscellaneous specifications are holding up relatively well.

Cincinnati — Miscellaneous sheet demand, including needs for household equipment, is fairly steady, but automotive demand continues disappointing. Generally, all new buying is for immediate shipment. Uncertainty over the outlook is reflected in a few suspensions of shipments against old orders.

St. Louis—Demand continues below expectations. Needs of stove and refrigerator interests are well maintained, but miscellaneous buying has fallen off noticeably. Corrugated roofing sheets are moving slightly better, particularly to the South, but manufacturing demand for lighter galvanized sheets is lighter than a month or six weeks ago.

Birmingham, Ala.—Sheets remain the backbone of steel production at the moment as declines have been noted in several other specifications. Output is at or near capacity, although it is probable there has been some slackening in both manufacturers' and roofing sheets. Little strip is being produced in this territory.

Carboloy Drills Reduced

Carboloy Co. Inc., Detroit, has announced reductions ranging up to 31 per cent on 14 standard sizes of Carboloy masonry drills, effective April 15. Introduced in January, these drills have doubled sales each month since and resulting manufacturing economies are being passed on to consumers.

Plates

Plate Prices, Page 88

Boston — Except for shipbuilding specifications, plate demand is light. Few carlot releases are being placed by miscellaneous consumers and less specified work is pending, although close to 1000 tons is still active for a New Britain sewage disposal plant. A good part of the tonnage required for eight submarines, four to be built by private yards, bids May 24, and four by navy yards, is expected to be placed by New England yards. An equal number of destroyers are being estimated. Railroad, structural and boiler shop buying is slack.

Philadelphia—Plate demand from boiler interests is slightly better, but business in general is quiet. Some ship releases at Chester, Pa., are expected later this month, and a fair tonnage is required for a mine layer just awarded the local navy yard.

Birmingham, Ala.—Most plate inquiries are in small lots, with no large individual tonnage. Demand is hardly better than fair, although there is considerable pending work.

San Francisco — The only plate letting of size went to American Pipe & Steel Corp., Alhambra, Calif., 700 tons for an 8 and 12-inch welded steel pipe line for Fallbrook, Calif. Alternate bids were taken on 678 tons of lapwelded steel pipe. So far this year 15,492 tons have been placed, compared with 12,428 tons for the same period a year ago.

Plate Contracts Placed

700 tons, 8 and 12-inch welded steel pipe, Fallbrook, Calif., to American Pipe & Steel Corp., Alhambra, Calif.

Bars

Bar Prices, Page 88

Cleveland — Steel bar orders are sustained in number but a falling off in size of individual purchases has restricted total tonnage. The decline in consumption lately has been small, leading to expectations of only a moderate recession in bookings for the near future. Lessened requirements of automotive interests account for a large share of recent tapering in demand.

Chicago—Business in carbon and alloy bars continues to lag, these items having been particu fected by recent declining for finished steel. Auton terests are buying lightl present demand is from range of miscellaneous which are holding their ments at a fairly consistent lowing recent slackening. tural equipment manufact terests have sustained their but some producing inter this source will begin to ta in the next 30 days.

Boston — In small lots, loys making relatively showing, commercial steel ing is unchanged. Comp more tonnage is going into parts. Consumers of forg are buying sparingly, inclu ducers of small tools and bile parts. Railroad dem tinues to lag, but shipyard tions are steady and jobl buying only to keep stocks b Machine tool shops are ste sumers in small lots, placed with secondary sell

New York—Outstanding demand are better speci from government shops and improvement in releases f chinery builders. Buying craft interests also is br while not involving a large represents a substantial doli ation. Hot-rolled carbon b relatively slow compared tivity in alloy and cold-dra terial.

Buffalo—Demand is we tained, despite absence of preciable pickup lately. Pr are maintaining fairly active schedules on mills devoted crete bar orders. Inquirie automotive interests are on

Birmingham, Ala.—Bars a ing fairly close to the somew ter tone noted several wee although there has been slackening in demand, es from agricultural imple sources. Concrete reinforcir continue in fair demand.

Tin Plate

Tin Plate Prices, Page 88

Tin plate demand is resp slowly to seasonal influences. ifications for sanitary can m are increasing, while needs f duction of line cans and misc ous items are sustained. Vol substantially better than a ye although in some instances are short of expectations h the trade earlier in the year.

Further gains in demand a ticipated this quarter, with th of the season still a numb

...Market Week—

...y. Tin plate operations ... per cent. Operations in ...o district are estimated ...ent.

...pe Prices, Page 89

...gh—Pipe production is ...dy, although improve... ...ome products has been ... seasonal and output of ... declined slightly. Stand... ...is moderately active in ...ns, but total business is ...pectations. Automotive ... steady, with completion ...odel buying in prospect ...l country goods still are ... quiet in drilling opera... ...sure tubing is somewhat ... than a month ago, with ...quirements smaller.

...l — Cast pipe backlogs ...ed, recent bookings hav... ...in excess of production ... some makers prospects ...operations for at least 30 ...ook for the entire quar... ...d. Inquiries and orders ... been made up of small ...are holding well in the ... Placing of most of 200 ...onneaut, O., bids recently, ...erred until summer. Steel ...ments are fairly steady. ... of the Socony Vacuum ...aves the line pipe market ...ny large lines actively

... Cast pipe buying is heav... ...easonal improvement in ...steel pipe has been slight, ...prices on the latter are ...with secondary distribu... ... by slightly more than ... for Newport, R. I., cast ...ge is bolstered by more ... purchases and slightly ...est by utilities. Wrought ...s slowly but steadily.

...rk—The largest cast pipe ... several years involves ...s, cement lined, 6 to 20-... bought by the department ...e, New York, bids April ...st 800 tons of fittings also ...ght. Other inquiries are ... somewhat below normal ...son. Plumbing and heat... ...cts on several fairly large ...nue held up, leaving the ... pipe market without im... ...velopments.

... Steel Corp. and National ...re expected to furnish ap... ...ly 28,000 tons of 10-inch ... line to be laid in Illinois ... for Socony Vacuum Oil

...ham, Ala.—Inquiries are

Cut Finishing Costs

...these Spiral Wound Brushes will help you do it!

DEPENDABLE, uniform finish on steel strip and tin plate is the goal of quality production plants. Don't overlook the brush which is the heart of the operation—make sure with Spiral Wound brushes of proved merit. Pittsburgh Plate Glass Company (Brush Division) brushes are delivering complete satisfaction in numerous big production plants.

Special Cooperation

These brushes are made with various fills, such as nickel-silver wire, tampico or horsehair—each with a specific purpose. Let our engineering representative show you how you can get uniformity and production. There's no obligation. Write or phone today.

PITTSBURGH
PLATE GLASS COMPANY
BRUSH DIVISION • BALTIMORE, MD.

more numerous, reports from local cast iron pipe plants indicate, and tonnage actually booked is in better volume than a few weeks ago, with the result that production, generally, is on a five-day basis.

Seattle—Demand is slow and no important new projects have come out. Bids were opened at Fort Lewis, Wash., April 13, for 200 tons of 10 and 12-inch cast iron pipe and fittings. Award of 115 tons of 4 to 8-inch cast iron for District No. 17, Seattle, is pending.

San Francisco — Cast iron pipe inquiries were limited to lots of less than 100 tons and only four projects involving 100 tons or more are pending.

Cast Pipe Placed

500 tons, various sizes, Newport, R. I., to R. D. Wood & Co., Florence, N. J.; Joseph DeCicio Co., Stoneham, Mass., general contractor.

100 tons or more, 12 and 14-inch, Swampscott, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

360 tons, 20-inch and und Mass.; bids April 21.

303 tons, national park ser City, Nev.; bids opened.

200 tons, 10 and 12-inch for Wash.; bids in.

125 tons, 6 and 8-inch for Wash.; bids April 20.

115 tons, 4 to 8-inch, Distric bids in.

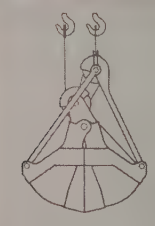
Unstated, 12,000 feet 4 to age disposal plant, Seasid ternates for transite and April 28.

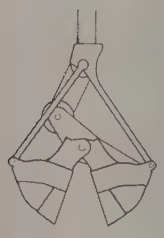
Steel Pipe Placed

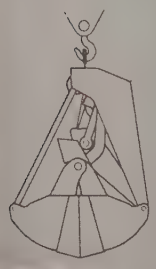
28,000 tons, 10-inch line pipe Vacuum Oil Co. pipe line, Steel Corp., Cleveland, a Tube Co., Pittsburgh.

Steel Pipe Pending

10,000 tons, 78-inch, Toledo works improvement; McGe apolis, low for general co







"This 2-line hook-on bucket, used where 2 hook blocks are available, is especially advantageous because:

It is a simple, rugged design having few parts—maintenance expense is low.

It is very easy for the crane operator to handle in picking up and discharging loads."

Blaw-Knox can meet your exacting requirements in bucket design. Send us your specification without obligation.

BLAW-KNOX *Digging and Rehandling* **BUCKETS**

BLAW-KNOX DIVISION
• OF BLAW-KNOX CO. •
Farmers Bank Bldg. Pittsburgh, Pa.

Wire

Wire Prices, Page

Pittsburgh—Wire orde duction are steady. Aut mand tends to moderate, a of buying for the 1939 is in prospect shortly. B ly has been steady, w small in order to keep s Merchant products conti bought in better volume, the peak of the agricultu has not been reached, v parently will be less than Prices on nails and other are firm.

Cleveland — Wire sale clined moderately so far t orders being smaller in and number. Manufactu demand is influenced by pace among automotive p ers, but activity in merc ucts is fairly well sustai latter make a particula able showing compared slow market a year ago. of fence posts to rural d also are relatively heavy.

Chicago—Demand for wire products is slightl though still at a relatively Orders are coming from a of consumers. Automotiv ments, however, are not ing.

Boston—Buying of wire is light and spotty. Vol some larger consumers, tomotive, has been slow t With little advance bus books, mills are asked fo delivery. Finishing sche uneven and closely linked releases. Buying of merc

light, resulting from cover- in the year during a pe- rice competition.

ork — Wire buying is un- and slack. Little business from automobile trade and ion in several other large s appears to be declining. es are low, but manufac- re apparently determined them so for the present, g actual requirements for elivery. Finishing opera- barely maintained at 50- nt and operating schedules ular.

gham, Ala.—Wire products g the leaders, demand hav- up exceedingly well over t quarter and continues us far in the second quar-

ls, Cars

Material Prices, Page 89

of 1150 freight cars and motives by Missouri Pacific ature of the railroad equip- rket. The Wabash has or- ur locomotives and Phelps rp. four switchers. Of the otives 14 are diesel-electric. has postponed bids on 20 ves to April 18.

ment of commerce reports ipments of locomotives, do- nd foreign, were 23, com- th 17 in February and 48 in 938; first quarter deliveries compared with 99 for the iod in 1938. These figures nclude locomotives built in own shops.

the coal strike the New tral is delaying general dis- of steel for quarterly re- ts. Recent opening of bids a cut of $2 per ton by a stern platemaker. Quota- erwise were firm.

rders Placed

Pacific, 1025 coal cars and 125 s, to Mt. Vernon Car Mfg. Co., non, Ill.; also coaches for two ned trains, to the American Foundry Co. for construction harles, Mo.; includes two bag- l mail cars, two mail storage o passenger coaches, two de- senger coaches, two diner-bar- cars and two parlor-observa- s.

arbon Co., ten 40-ton covered cars, to American Car & Foun- New York.

otives Placed

Pacific, two 2000-horsepower lectric locomotives and also sel switch engines, to the Elec-tro-Motive Corp., La Grange, Ill., and one 1000-horsepower switch engine each to the American Locomotive Co., New York, and Baldwin Locomotive Works, Eddystone, Pa.

Phelps Dodge Corp., New York, four 1000-horsepower diesel-electric switchers, to Electro-Motive Corp., La Grange, Ill.

Wabash, three 600-horsepower switchers to Electro-Motive Corp., La Grange, Ill.; one 660-horsepower switcher to American Locomotive Co., New York.

Locomotives Pending

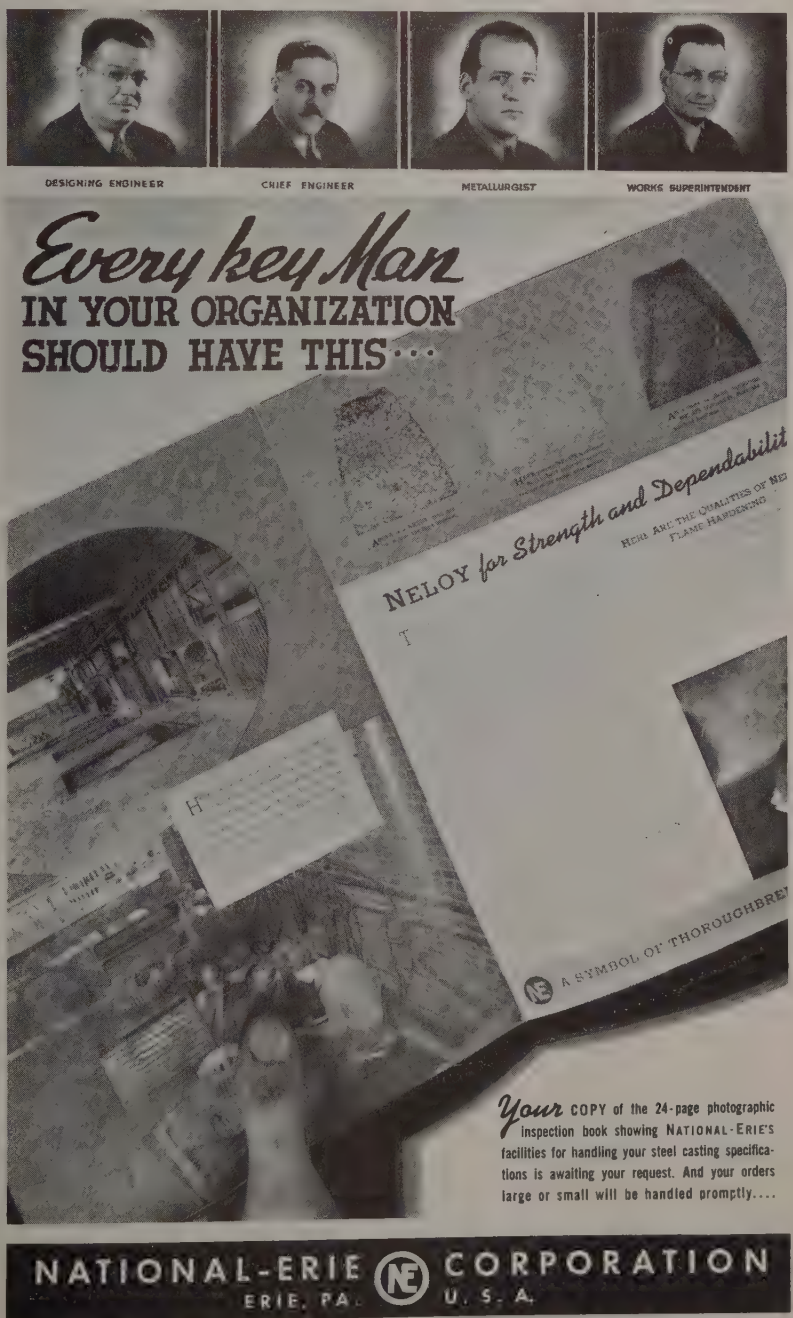
Navy, bids on 20 locomotives postponed to April 18.

Shapes

Structural Shape Prices, Page 88

Cleveland — Outstanding award, 1870 tons for the Carter road bridge here, was placed with Mt. Vernon Bridge Co., Mt. Vernon, O. Excluding a number of large bridge projects scheduled to appear for bids soon, inquiries have failed to record much improvement recently. Volume of private work is particularly light.

Pittsburgh—Structural awards are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METALLURGIST
WORKS SUPERINTENDENT
Every key Man
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ERIE, PA. U. S. A.

holding up well, with an increasing number of projects coming out under private initiative. A new viaduct on Fifteenth street, Kansas City, Mo., will involve 4000 tons of structural shapes and plates, while 2000 tons will be required by the bureau of reclamation for a crossing at Sacramento, Calif.

Chicago—For the third consecutive week total pending structural tonnage has increased. Warmer weather is bringing out projects. While volume of minor tonnages is quite large, there are a number of substantial tonnages also pending.

Boston—I-beam bridges, Vermont, closing April 21, require close to 625 tons, while a viaduct, Providence, R. I., takes close to 1500 tons. Structural contracts are fewer, however, with 250 tons included for an aircraft factory building in Connecticut. Inquiry is also lower, notably for public buildings. Massachusetts highway program is held up by a contest over the budget. Fabricated prices continue weak.

New York—Structural activity is featured by the award of 3700 tons, state hospital buildings, l N. Y., to Bethlehem F Inc., Bethlehem, Pa. and a al 6500-ton contract for ous material, mostly struc tunnel supports for anoth Delaware river aqueduc inquiry, led by 1200 tons fo addition, Erasmus hall, closing April 19, is slight tive with bids in on clos tons for New Jersey state

Philadelphia — Despit sluggishness, construction ments include a few fair nages. Fort Pitt Bridge Pittsburgh, booked 2200 to apartment building here, Turner Construction Co. jacent district 3000 tons h awarded for the American Corp. plant, Narrows, Va ginia Bridge Co. Pending cludes 1200 tons for the sta control building, Harrisbu McCloskey & Co., Philadelp eral contractor.

Buffalo—New life was in to the structural market h the announcement that t stantial private projects w underway in the near futu ed to these projects are i government financed jobs, ing for large tonnage, on w ding dates have been anno

Seattle—New projects a oping slowly and prospects promising than in the first The larger shops have a fai of work in hand. Local p figuring on 1700 tons for th bridge, Seattle, which may concrete or steel.

San Francisco—While vo inquiries remain substanti changed, a fair sized bo structural shapes aggregat tons, were reported. This the total to date to 43,529 t pared with 43,529 tons in 1

St. Louis—Interest in st centers in the Fifteenth st duct, Kansas City, Mo., f 3500 tons of structurals and of welded trusses, bids d 15. Several small projec

SWITCHING ECONOMY

This 30-ton Whitcomb Diesel-Mechanical locomotive is assigned to regular interdepartmental work in connection with Hot Mill operation at the plant of John A. Roebling's Sons at Roebling, N. J.

The complete locomotive line of Baldwin and Whitcomb permits us to offer unbiased recommendations as to the type of power best suited to your conditions. Without obligating you our engineers will survey your requirements and estimate the savings you can expect from Whitcomb power.

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Gasoline or Diesel Mechanical Drive
Gasoline or Diesel Electric Drive
Electric Storage Battery
Electric Trolley

WHITCOMB LOCOMOTIVES

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

Shape Awards Comp

Week ended April 15	
Week ended April 8	
Week ended April 1	
This week, 1938	
Weekly average, year, 1938	
Weekly average, 1939	
Weekly average, March	
Total to date, 1938	
Total to date, 1939	

Includes awards of 100 tons

d, the largest a postoffice
ere requiring 240 tons,
o Atlas Iron Works, St.

Contracts Placed

south side vocational school,
to Duffin Iron Co., Chicago.

building, Pilgrim state hospi-
twood, N. Y., to Bethlehem
rs Inc., Bethlehem, Pa.; Turn-
uction Co., New York, general
r.

444 transmission towers, TVA
Middletown, Tenn., to Ameri-
ge Co., Pittsburgh.

tunnel ribs, inner lining, bars
ellaneous material, sewer, two
, Boston Metropolitan district
Everett-Chelsea, Mass., to Beth-
eel Co., Bethlehem, Pa.; Silas
Co., New York, general con-

plant building, American Cela-
p., Narrows, Va., to Virginia
o., Birmingham, Ala.

apartment building, Philadel-
Fort Pitt Bridge Works, Pitts-
through Turner Construction
adelphia.

Carter road bridge, Cleveland,
Vernon Bridge Co., Mt. Ver-

195 transmission towers, TVA
Florence, Ala., to American
Co., Pittsburgh.

substations and transmission
for river crossings, Bonneville
reg., to Bethlehem Steel Co.,
ncisco.

infirmary buildings, mental
Willowbrook, N. Y., for state,
ont Iron Works, Philadelphia.

garage, Brooklyn, N. Y., to
n Bridge Co., Pittsburgh;
procurement division, treasury
ent, New York.

auditorium, Michigan State
ty, Lansing, Mich., to Fort
dge Works, Pittsburgh.

bridge, Sumter county, South
a, to Virginia Bridge Co., Roa-
a.

alterations municipal pier No.
h river, New York, to American
Co., Pittsburgh; through Lynn
ction Co. Inc.

highway bridge, Winfield, Kans.,
sas City Structural Steel Co.,
City, Kans.; through List Con-
n Co.

Kansas Light & Power Co.,
house, Abilene, Kans., to Mis-
alley Bridge & Iron Co., Leav-
, Kans.

bridge, New York Central rail-
onkers, N. Y., for Westchester
park commission, to American
Co., Pittsburgh.

, addition to postoffice and
house, Los Angeles, to Con-
d Steel Corp., Los Angeles.

factory addition, for United
t Corp., Stratford, Conn., to
n Steel Co., Youngstown, O.

school, Wappinger Falls, N. Y.,
ated fabricator; John Eisele Co.,
ork, general contractor.

school, Wappiners Falls, N. Y.,
rican Bridge Co., Pittsburgh.

two dry dock cranes, for navy,
l, O., to Fort Pitt Bridge Works,
rgh; through R. W. Kalten-
orp., Bedford, O.

stage, Universal Picture Corp.,
Los Angeles, to Bethlehem Steel Co., Los Angeles.

300 tons, city hall and community building, Emporia, Kans., to W. R. Grimshaw Construction Co., Tulsa, Okla.

290 tons, juvenile court building, Washington, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, apartment, Wynnewood, Pa., to Belmont Iron Works, Philadelphia; through Nelson Pedley Inc., Philadelphia.

260 tons, bottling plant, for Coca Cola Bottling Co., Worcester, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

260 tons, dormitory building, Connecticut state college, Storrs, Conn., to Haarmann Steel Co., Holyoke, Mass.

250 tons, addition to building, for Frank R. Jelleff Inc., Washington, to Barber & Ross Co. Inc., Washington.

240 tons, St. Louis postoffice garage, to Atlas Iron Works, St. Louis; through J. S. Alberici, St. Louis.

230 tons, junior-senior high school, Sinclairville, N. Y., to Buffalo Structural Steel Co., Buffalo.

230 tons, plant addition, General Baking Co., 144th street, New York, to Bethlehem Fabricators, Bethlehem, Pa.

225 tons, school, Cassadage Valley, N. Y., to Buffalo Structural Steel Co., Buffalo.

215 tons, railroad bridge, Mosell, Mo.,

WATCHDOGS of DOOR COSTS

Kinnear Rolling Doors are mighty tough customers when it comes to protecting doorways and door costs. Dependable watchdogs . . . constantly on guard against inefficiency! And their blue-ribbon performance has been proved in continuous daily service over a period of more than forty years.

Opening upward and coiling compactly above the lintel, Kinnear Doors save valuable floor and wall space. They stay out of the way when open . . . out of reach of accidental damage by trucks and cars, or wind. Their rugged all-steel construction and interlocking-slat design assure exceptional durability. They will not sag, warp, split or pull apart, and they protect against fire, vermin, burglary and the elements. All of which mean **lower** operating and maintenance costs! Every Kinnear Rolling Door is specially built, for manual or electrical operation, to exactly fit the opening for which it is intended. That helps to keep installation costs at the very lowest. And remember, Kinnear Door Service is backed by a nationwide organization of specialists in the designing and building of upward-acting doors. Take advantage of Kinnear's complete door service . . . Write today for details or recommendations to fit your own problems!

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1780-1800 FIELDS AVE., COLUMBUS, OHIO
Offices and Agents in All Principal Cities
FACTORIES: COLUMBUS, OHIO — SAN FRANCISCO, CAL.

to Stupp Bros. Bridge & Iron Co., St. Louis.

210 tons, Thomas Jefferson memorial, Washington, to Fort Pitt Bridge Works, Pittsburgh.

200 tons, bridge section 6-VF, Madison county, Mitchell, Ill., to Missouri Bridge & Iron Co., St. Louis.

195 tons, bridge 1541, Nicholas county, West Virginia, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

180 tons, St. Louis, Chippeway street underpass, to Stupp Bros. Bridge & Iron Co., St. Louis; through Stiers Bros. Construction Co.

165 tons, bridge over Boston & Maine railroad, Bernardstown, Mass., for state, to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bridge, section 5-VF, Madison county, Mitchell, Ill., to Vierling Steel Works, Chicago.

155 tons, state bridge, Bernardston-Greenfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, warehouse, S. S. Pierce Co., Boston, to New England Structural Co., Everett, Mass.

140 tons, fat rendering building, Philadelphia, to Hess Iron Works Inc., Philadelphia.

135 tons, guard rail, Major Degan boulevard, Bronx, New York, to North American Iron & Steel Co., Brooklyn, N. Y.

125 tons, Santa Maria river bridge, Yavapai county, Arizona, t[o] interest.

125 tons, stage, Paramount Pic[ture] Los Angeles, to Bethlehem [Steel] Los Angeles.

125 tons, bridges, Kansas and [Missouri] for Missouri Pacific railroad, [Ameri]can Bridge Co., Pittsburgh.

110 tons, reconstruction of br[idges] Rochester, Minn., for Chi[cago] Western railroad, to Ameri[can] Co., Pittsburgh.

100 tons, 3-span WF beam brid[ge] boro-Jamaica, Vt., to Americ[an] Co.; Carlo Bianchi & Co. Inc., [Cam]ham, Mass., general contrac[tor]

Shape Contracts Pen[ding]

6000 tons, Shasta dam towers, [Central] reclamation, Redding, Calif.

3500 tons of shapes and 435 [tons] welded trusses, for Fifteen[th] viaduct, Kansas City, Mo.; bids [in]

3000 tons, Southern Pacific [Co.] bridges, Central Valley, Ca[lif.] April 21.

2500 tons, new convention hal[l] $2,700,000, Buffalo; bids May [4]

1700 tons, Ballard bridge, Sea[ttle] ternate concrete); bids to [city] public works, May 4.

1500 tons, vehicular tunnel, Mob[ile] bids in.

1200 tons, building, state liquo[r] bureau, Harrisburg, Pa.; McC[lin] Co., Philadelphia, general co[n]

1200 tons, addition, Erasmus hal[l] Brooklyn, N. Y., for board o[f] tion.

1200 tons, Kleinhans Music hall, [to] $1,200,000, Buffalo; bids May

800 tons, Doney creek bridge, [Central] Valley project, Calif.; bids A[pril]

625 tons, grade crossing, Norther[n] vard, Queens, N. Y.

600 tons, Nazareth hospital, Phila[.] McCloskey & Co., Philadelphia, [gen.] contractor.

550 tons, social security building[,] ington.

500 tons, club house, for [Madison] Square Boys' club, New York.

500 tons, bridge reconstruction [over] river, Oreg.; bids April 24.

500 tons, new store, W. T. Gra[nt] Buffalo; bids April 24.

500 tons, Commodore Perry housi[ng] ect, Buffalo; bids April 27.

450 tons, ward 2, Gallinger [Hospital] Washington, for District of C[olumbia]

450 tons, vocational high sch[ool] Keesport, Pa.

400 tons, central school, Clyde [-Savan]na Sauke Bros., Rochester, N. Y.

400 tons, Harlem Boys' club, New

325 tons, boiler house, Niagara [Falls] for Kimerly-Clark Corp.

325 tons, roof trusses, Manitowoc [Ship] for unstated owner.

300 tons, Taylor overpass, Wash[ington] Harry Dickens, Philadelphia, [gen.]

300 tons, boiler house, Niagara, [N. Y.]

300 tons, state bridge, Kremmling[-Hot] rado; bids in.

264 tons, bridge, Grand county, [Colo.] rado; bids in.

250 tons, school, Eden, N. Y. [Bids] April 27.

220 tons, highway bridge, Till[amook] Oreg.; bids in.

205 tons, state bridge, Trinidad, [Colo.]

200 tons or more, four high tra[ck]

DEPENDABLE
SERVICE
QUALITY

1906 33 years 1939

DAMASCUS MANGANESE AND ALLOY CASTINGS

Manganese and Alloy Steel Castings One Half to One Thousand Pounds Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

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New Brighton, Pa.
(Pittsburgh District)

rs over Willamette river, Bonneville authority; Steel n Co., Portland, Oreg., low. hool, Chagrin Falls, O.; Gilnichael & Olson Co., Cleve-

lding, Bridgeport, Conn., for wner.

n's dormitory, state univerabus, O.; Skelken Bros., Cow.

Vashington state bridge at ids in.

te Sixth avenue N. E. underSeattle; bids in.

ower house addition, Tide Co., Bayonne, N. J.

dition to foundry building, or unstated owner.

idge, Sandune, Tex., for In-l Great Northern railroad.

ghway bridge, Somerset, Pa., sylvania Turnpike commis-

rade and high school, Red Y.

uilding addition, for Joseph n & Son, Louisville, Ky.

idges for Alaska road comids in at Seattle.

tory building, for Coca Cola o., Glens Falls, N. Y.

wo 5-span state bridges in bids in.

inforcing

cing Bar Prices, Page 89

gh—Reinforcing bar marholding steady, with both demand firm. Inquiries equal to the placements, rease in privately financed een noted. Current prices und 1.90 cents base in icts, with little weakness point noted. One exceptthern Ohio, where a few jobs are reported below

d—Inquiries include 1200 e Valley View and Luna ng projects here. Bids on project go in April 28, iate has been set for the

e Bars Compared

	Tons
ed April 15	10,900
ed April 8.....	3,852
d April 1.....	11,872
1938	12,772
erage, year, 1938	6,959
erage, 1939	11,263
erage, March....	10,279
ate, 1938	81,723
ate, 1939	157,689

awards of 100 tons or more.

latter. Private work is slow. Operations among local fabricators are irregular, with backlogs substantially cleared. Prices continue weak.

Chicago—Demand has been substantially heavier than for other lines of steel commodities the past few weeks. Aided by spring construction activities, awards have tended upward. However a tapering in demand is reported with new jobs slowing down in volume and tonnage. Largest of new inquiries is another Chicago subway section to be bid soon.

Boston—Small-lot buying tends upward while 500 tons have been placed for a dike wall and sewer, Springfield, Mass. Recently, sewer requirements have been outstanding. Bridge needs and engineering projects lag. Prices are slightly steadier.

New York—Awards are heavier, including 3000 tons for a section of the East River drive, New York, going to a Pittsburgh district mill. Inquiry in the east is led by close to 9000 tons for two government buildings, Washington, bids close April 26.

Philadelphia—Demand is dominated by 9000 tons for the social se-

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Capacities to 445 cu. ft. per min.
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Tank mounted or on plain base
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LOS ANGELES NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS SAN FRANCISCO SEATTLE WASHINGTON

Behind the Scenes with STEEL

What Price Prosperity?

■For the last week or so we've been moody and lethargic. This damned European situation is enough to drive a guy to distraction, business and the stock market both seem to need a spring tonic of sulphur and molasses, and the last two or three movies we've seen were pretty lousy. What's more, we've spent so much time and energy wrestling with Lady Temptation to keep from smoking that we're just about done in. That is, we were until A. H. Friese, president of Welding Engineering Co. up in Milwaukee shamed us into some optimistic enthusiasm with this letter just received: "We certainly like your magazine STEEL. We are swamped with orders, really. In February and March I completed a four week trip through the west establishing three offices. During the last of March I flew the Central states from Minneapolis to Houston and opened five more new offices. Today I fly east to open five more, believe it or not." We ask you, when's a man like that going to find any time for a good tough game of Chinese checkers.

Phoney Photo Phellows

■ Every so often we have to run up the warning flag about this or that photographer who is making the rounds of our good readers, telling them they are the official representatives of STEEL or the Penton Publishing Co Once again we say, "T'ain't so!" If anyone tries to put the bee on you with this kind of a tale, don't write—telegraph our nearest office.

Railroad Ripley

■ A believe it or not in the railroad industry came to our attention recently out in Chicago. It is a road that carries no passengers or freight, has very little equipment but still operates consistently at a profit. This railroad Ripley is the Indiana Harbor Belt Line which maintains 628 miles of track in the Chicago metropolitan area. As you may realize, no railroad runs through Chicago and this accounts for the unusual position held by the belt line. Its rolling stock is all locomotives and cabooses and each year it switches over a million cars from the terminus in Chicago to one of the other lines.

Last Chance

■ That sponge iron story last week seems to have created quite a stir and we have just a handful of overruns left on the stockroom shelves. Also available are a few copies of the financial analysis so if you want either one just drop us a note.

Thank You, Fred

■ Our most regular and faithful correspondent, Fred Chambers of Luckey, Ohio and the National Gypsum Co. last week sent Ann three good old-fashioned balloons with her name very prettily printed on each one. Two of them have already gone the way of all good balloons but she did want to drop in this thank-you note if we may.

Combination Honeymoon

■ Apparently there was a salesman (one of our own it is rumored) who was recently married and decided to honeymoon in a part of his regular territory. After a few days a note to the home office explained the appearance of some orders and reports from him which were totally unexpected. You see, he wrote, I figured that while we were up in this neck of the woods, I'd squeeze in a few calls between squeezes.

Like the Duce

■ Have you heard why Herr Hitler has been drinking so much Italian beer lately?

SHRDLU

curity and railroad ret
reau buildings, with bi
April 26. Two sections
sylvania all-weather hi
also up for bids sectio
prising 1¾ miles, to be o
27 and section KB-2, co
miles, April 28.

Seattle—More than 4
involved in two Seatt
projects, the federal
and Ballard bridge, to be
in the next month. N.
Chicago, is low at $1,22
former job, which will r
1700 tons. Seattle has
May 4 for the Ballard
feet long which will in
2500 tons with alternat
turals, about 1700 tons.

San Francisco—New
pear slowly and awards
ticularly heavy, totalin
tons and bringing the a
the year to 58,927 ton
with 26,966 tons last y
hem Steel Co. took 95
science building for a j
in San Francisco.

Reinforcing Steel

3000 tons, contract 6. Eas
New York, to Carnegie
Corp., Pittsburgh; J. Ri
New York, general contr

2220 tons, for Coulee da
hem Steel Co., Seattle.

950 tons, science building,
San Francisco, to Bethle
San Francisco.

390 tons, reconstruct s
Calaveras dam, Sunol, C
Steel Co., San Francisco.

390 tons, including 200 to
school, Gloucester, Mass
Steel Co., Youngstown, O

385 tons, dike flood wa
Mass., to Concrete Ste
John O'Connell's Sons
Mass., general contracto

300 tons, men's dormitor
Ohio State university,
to Pollak Steel Co., C
through Hausman Steel

285 tons, including 130 to
school, Wappinger Falls,
Steel Products Corp., Je
Eisele Co., New York,
tractor.

260 tons, school, South
Ceco Steel Products Cor

240 tons, sewage disposa
caster, O., to Pollak S
cinnati.

220 tons, superstructure of
Laramie avenue, Chica
Steel Co., Chicago.

220 tons, St. Louis, Banne
Sheffield Steel Corp.,
through Kellerman Const
Louis.

200 tons, music hall, Pur
West Lafayette, Ind., to
Corp., Cleveland, thr
Steel Co., Youngstown,

200 tons, municipal buil
Kans., to Missouri Rolli
St. Louis.

200 tons, warehouse, S.
Boston, to Concrete Ste

200 tons, bridge, Rock Isl

land Steel Co., Chicago.

easury department, invita-
, Los Angeles, to Bethle-
Co., Los Angeles.

wage plant, Peru, Ind., to
teel Corp., Cleveland.

uditorium, Marina junior
l, San Francisco, to W. C.
o., San Francisco.

dition, Cambridge high and
school, Cambridge, Mass.,
e Steel Co., Boston; Rugo
n Co., Boston, general con-

uilding, Century Distilling
Ill., to Bethlehem Steel Co.,
Pa.

highway, North Adams-
wn, Mass., to Truscon Steel
al Construction Co., Law-
s., general contractor.

ibrary and administration
University of California,
lif., to W. S. Wetenhall Co.,
isco.

dge, South Damen avenue,
o Concrete Steel Co., New

ious local building projects,
Seattle Steel Co., Seattle.

ing Steel Pending

ial security and railroad re-
uildings, Washington; bids

more, Ballard bridge, Seat-
to board of public works,
ernate plans for shapes.

ederal courthouse, Seattle;
rin, Chicago, low.

lley View housing project,
bids April 28.

una Park housing project,
no bidding date set.

rmitory, Northwestern uni-
anston, Ill.

stern regional building, de-
f agriculture, San Francisco;

hway projects, Putnam and
nties, New York, E. A. Otta-
Croton-on-Hudson, N. Y.,
Roads Contracting & Engi-
, Wantagh, N. Y., general

w convention hall, Buffalo;

modore Perry housing proj-
o; bids April 27.

tract 4, sewer, Queens, N. Y.

ylor overpass, Washington;
ens, Philadelphia, low.

dge, route 72, section 119,
y, Illinois.

w store, W. T. Grant Co.,
ds April 24.

Kleinhans Music hall, Buffalo;

tion 4A, Pennsylvania turn-
ssion, Westmoreland county;
14.

a Cola bottling plant, Phila-
ark Co., Philadelphia, gen-
ctor.

te bridge Tillamook county,
acobsen-Jensen Co., Port-

tions 16A and 17A, Penn-
turnpike commission, Ful-
; bids April 14.

tate highway letting FA-
205-AGS, Frankfort, Ky.; bids April 12.

200 tons, contract MC-39-11, circumferential highway, New York; bids April 18.

175 tons, new school, Clyde, N. Y.; Sauke Bros., Rochester, N. Y., low.

156 tons, public school building, New Orleans; bids April 3.

150 tons, state liquor control bureau, Harrisburg, Pa.; McCloskey & Co., Philadelphia, general contractor.

150 tons, orphanage, Order of Sons of Italy, Concordville, Pa.; bids April 15.

150 tons, Ward Gallinger hospital, Washington; bids April 18.

140 tons, Lake street viaduct, San Francisco; Union Paving Co., Babcock building, San Francisco, low.

137 tons, two bridges, Santa Clara county, California, for state; Dan Caputo, San Jose, Calif., low.

130 tons, Wellston, Mo., high school; Fleischer-Sieger Construction Co., St. Louis, awarded general contract.

110 tons, Nazareth hospital, Philadelphia, McCloskey & Co., Philadelphia, general contractor.

106 tons, public school building, Davenport, Ia.; bids April 13.

100 tons, highway bridge over Levisa river, Buchana county, Virginia; Haley, Chisholm & Morris Inc., Charlottesville, Va., low bidder.

Unstated tonnage, two sections, A-2 and KB-2; bids April 27 and 28, respectively.

Unstated tonnage, Rock creek sewage project, Washington; James Lombardi, Philadelphia, low.

Semifinished

Semifinished Prices, Page 89

Pittsburgh—Movement of semifinished steel continues to vary widely from week to week, but the April total apparently will fall below March. Part of this is due to the

● Page Hi-Tensile "F" is an all purpose electrode—fast running, easy handling. It gives a weld of great strength and ductility. Equally good in all positions on production, maintenance and shop welding.

Page Hi-Tensile "F" operates on straight polarity. It has unusually low spatter and slag loss. A great favorite for high-speed, single-pass welding—and for jobs in Cro-man-sil, Corten, H-T-50 and other new alloy steels. . . . See your local Page distributor. He may be able to make helpful suggestions.

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letdown in sheet and strip production, although tin plate needs are tempering the decline. Wire rod output shows little change, with skelp slightly less active.

Pig Iron

Pig Iron Prices, Page 90

Pittsburgh—Pig iron releases and new business are slower. Operations of some large melters are steady, while jobbing foundries remain fairly active. Radiator manufacturers are carrying heavy stocks of finished products, although business has expanded steadily so far this year. Sanitary ware makers also show fairly good shipments despite less improvement than expected from new construction. Coke movement has declined, partly because of the season. Stocks of coke and coking coal are adequate, and little possibility of a shortage is seen, even if the coal strike is protracted.

Chicago—Shipments are about 15 per cent behind the first half of March, both in pig iron and by-product foundry coke. Early estimates indicated a slight decline in tonnage for April, but these may have to be revised, as present rate of movements is below expectations. Sales are irregular, most consumers already being on the books for second quarter needs. Foundry melt is slowing, automotive demand having tapered. Agricultural casting requirements are well maintained but seen as likely to drop off in another 30 days.

Cleveland—A small decline, possibly 10 per cent, is indicated for pig iron shipments this month. Foundry operations are spotty, producers of automotive parts being less active, while some jobbing plants are busy on miscellaneous work. Certain melters are unusually cautious in stock acquisitions, pig iron releases being deferred until supplies are exhausted. As a result, sellers are unable to schedule shipments far ahead. New business is slow, with small lots predominating.

Boston — Pig iron buying continues to drag, mostly in small lots in districts affected by the recent truck strike, notably in Rhode Island. On the whole foundry melt has failed to improve, with a few exceptions, notably the district cast pipe foundry. Close to 1000 tons of Indian iron is expected at Boston and Bridgeport this week.

New York — Extreme dullness marks pig iron trading. However, consumer stocks are low and will require additions in the event of better casting demand. Specifications from manufacturers of soil pipe, machinery and hardware comprise the principal activity. The New York state barge canal has opened its navigation season, permitting water shipments from Buffalo furnaces.

Philadelphia—Shipments are light but are in excess of new orders. In view of some second quarter contracting last month it is not surprising that new orders are l
lack of improvement in c
is disappointing. The
Pa., stack is expected
shortly.

Buffalo—Pig iron del
off slightly from the ra
ago, despite a small ga
tions of some foundries.
encouraged by low inv
consumers as well as
stocks of casting users
production holds at 57 p

Cincinnati—Early-Apri
of pig iron, both no
southern, held close to
els, but specifications
mainder of this month
slowing down in deman
continue conservative,
and in shipping orders,
ries being without backl

The market shows
that early expansion i
lines will offset the pr
ing tendency in the mel
for castings from ma
builders is unaffected.

St. Louis—Shipments
fairly well, but new
quiet, partly because lar
are due against previou
Operations of stove, hea
ment and farm implem
show little change sinc
ago, but seasonal impr
activity of stove foundri
Backlogs and productio
foundries are off slightl

Birmingham, Ala.—Ou
iron is unchanged with
in blast. Melters des
ments at the moment
volume of bookings a
tory.

Toronto, Ont.—The w
dropped below 1000 tons
for the year. Buying is
spot needs, with forward
negligible. Uncertainty
outlook and expectatio
changed prices are reta
age of future requirem

Ferroalloys

Ferroalloy Prices, P

New York — Ferr
shipments show little
with ingot production
reduction in total moven
month is indicated. Don
are steady, while quotat
ported material are firm
attributed to withdraw
ings from what wa
Czechoslovakia. Shipm
that area now are sub
higher duties that apply
territory, making price
to be competitive.
specifications and pric
changed.

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KIDD DRAWN STEEL CO.
Aliquippa, Pa.
(*Pittsburgh District*) *Phone: Aliquippa 196*

rap

Scrap Prices, Page 92

urgh—No. 1 heavy melting down 50 cents to $15 to on broker offerings at this One sale of a small tonnage en reported and other larger s are believed pending. Of- still are not large, the easier being due to lack of buying nfluence of weakness in other s, rather than to accumula- distress material.

land — Inactivity in scrap resulting in a cut of about s a ton on some grades, in- blast furnace material, No. eling, cast, forge flashings nd bundled sheets. No. 1 melting now is $14 to $14.50, o. 2 is $13 to $13.50, and sheets $14 to $14.50.

small sales have been made new levels, but most current is confined to routine ship-

ng of the New York Central t list is said to have resulted steelmaker in southwestern aying $15.25 for heavy melt- el, the remainder going for at around $16.

go—Scrap prices have de- harply. No. 1 heavy melting off $1.50 on a sale at $13, ther grades have weakened tive amount. Quotations had largely nominal during an d period of inactive demand mills. Upward of 8000 tons olved in the latest purchase, timated.

n—Prices of some scrap are lower, including chemi- ngs and stove plate for east- nsylvania delivery and No. inery cast for district deliv- ard dealers still are paying unprepared heavy steel, re- the firm export situation. oker has dropped his export cents, paying $13.75 as top 1, dock, and $12.50 for No. 2.

delphia—The scrap situation d. Sentiment is easier, but l is not coming out freely ces generally are unchanged. nued heavy movement abroad ering prices on heavy melt- el. Stove plate is down to nsuming point, on a recent sale.

it—Absence of buying inter- he part of mills and brokers en accompanied by further ns in prices of 25 to 50 cents. believe it will be another r two before any definite f a firmer market develop. ial heavy melting is off 50 cents, as also are flashings and short rails.

Buffalo—Despite absence of large sales, local scrap prices are down 25 cents, with No. 1 heavy melting steel $13.50 to $14. Reductions reflect the purchase of 5000 tons, mostly No. 1 bundles, by a leading consumer, on the basis of the lower range for No. 1 material.

Cincinnati—Scrap is weaker and prices are nominal although unchanged. Demand is quiet and recent bids on railroad offerings were lower than last month. Mills appear well supplied with scrap for current needs.

St. Louis—The market is at almost a complete standstill, with the tone weak. Prices have been reduced on several grades. Inquiries as well as orders are absent, with mills and foundries awaiting clarification of the business situation before making commitments. Light offerings are holding distress scrap to a minimum. A steady flow continues to consumers against old contracts.

Birmingham, Ala.—The market is inactive, with prices showing evidence of weakness.

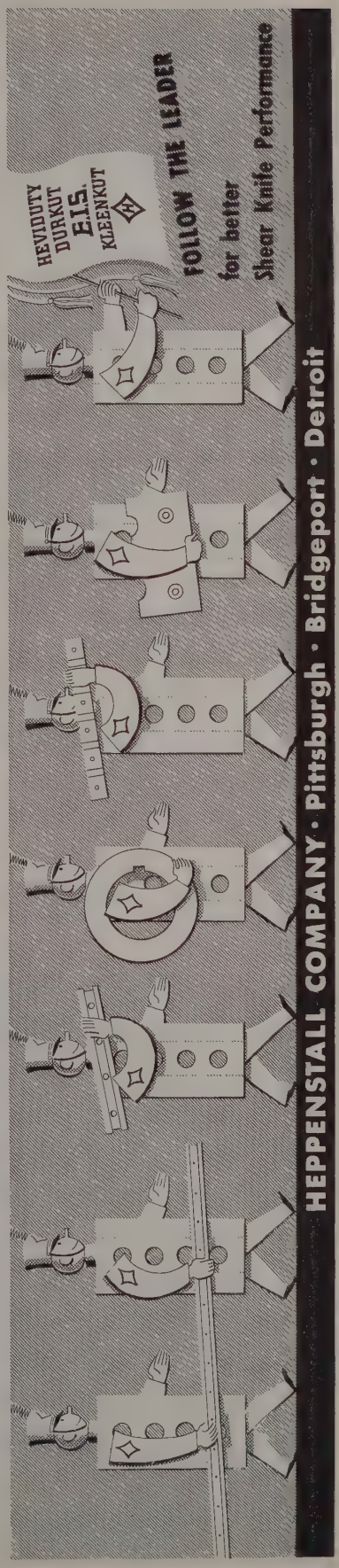
Seattle — Agitation against exports of metals, and picketing of ships loading scrap at Pacific coast ports have caused Japanese buyers to limit purchases in this area. Local dealers report some new orders from the Orient but not in the volume expected. Export prices are firm at $14.50 for No. 1 melting, or slightly higher. Local rolling mills are a factor in the market, paying about $11 and $12 for No. 2 and No. 1 respectively.

Toronto, Ont. — A stronger market has developed here, with prices of most grades up 25 cents a ton. Dealers indicate better sentiment and expectations of improved business as responsible for the upturn. No. 1 machinery cast and heavy melting steel are in good demand, with yard supplies small. No. 2 cast also is active, but increased offerings are looked for soon.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Bolt, nut and rivet demand shows occasional gains. Improvement is entirely in specifications against old orders, since new business is lagging. Automotive releases are slower, but construction projects involve heavier shipments. Considerable new ship work is in prospect for the next several weeks. Cap screw manufacturers are benefiting from better activity among machinery builders.



Warehouse

Warehouse Prices, Page 91

Cleveland—Warehouse sales have tapered moderately, influenced by some decrease in consumption and by a more cautious attitude among buyers. Prospects for a pickup later this month have been dimmed by impaired sentiment among warehouse customers.

Chicago—Business to date this month is well ahead of the March period, though the comparison is with the poorer half of last month. Nevertheless, a favorable record for April is in prospect. Orders are widely diversified.

Boston — Volume this spring has been disappointing, notably in the Boston metropolitan district. A few outside jobbers, at Hartford especially, are making slightly better showing. Buying is well diversified as to products. Cold-finished bars and galvanized sheets have been reduced 25 cents per 100 pounds.

Philadelphia—Sales are down substantially from March, with little prospect of early recovery to last month's level.

Buffalo—Warehouse business generally is unchanged at a fair rate. Buying is for only immediate needs. Expected improvement in demand for structural items has yet to appear.

Cincinnati—Warehouse sales are more numerous, but the average tonnage is smaller, so that volume remains at a level with February and March. Many industrial users are buying only when need is immediate. Competitive conditions have caused price unsteadiness in some items.

St. Louis—Business is quiet, customers either postponing orders or restricting their purchases. Recent price reductions have been without effect on sales. Oil country supplies are moving well and some building items are more active.

Seattle—Slightly improved turnover is reported but seasonal buying continues slow. Sheets and bars are in best demand.

Iron Ore

Iron Ore Prices, Page 92

Cleveland — Cold weather the past two weeks in upper lake regions makes it possible that opening of the iron ore navigation season will be the latest of the past ten years. Temperatures well below freezing keep the Soo canal closed, while Duluth harbor again has frozen solidly after opening up a short time ago. Present indications point to May 1 as the earliest date for ore movement, compared with April 12 last year. In 1936 and 1934, shipments did not start until April 29, but the last time navigation was deferred until May was in 1928, when May 3 witnessed the first movement. In the meantime, inquiries for iron ore still are awaited, while mines in the Lake Superior district are loading ore in delivery to the docks sh boat arrivals.

Ore Imports Heav

Baltimore—Iron ore a March were the heavies months, totaling 199,008 to 172,294 tons in February 637 tons in January. T previous total was 220,05 October last year. Shipr month compared with 10 in March last year.

Manganese ore arrivals compared with 12,990 ton ruary, 39,270 tons in Jan 48,368 tons in March a Chrome ore imports comp tons, all in one shipment.

Ferromanganese impo substantially heavier tha preceding month, when cargo of 1600 tons came in. in March included a lot of from Gdynia, 300 tons fro 300 tons and 335 barrels fr and another lot of 500 ton barrels from the same por from Ymuiden, 20 tons G other from Sauda, 450 t barrels and 79 drums a Heroen, 400 tons.

Two shipments of pyr from Huelva, totaled 9187 shipment of 7750 bags of came in from Murmansk bags of fluorspar came f deaux. Shipments of ilme comprised 13,050 tons.

Philadelphia — Eight tons of chrome ore were here during the week end 8. This tonnage was com two shipments, one fro Africa involving 4200 tons other from Cuba involving

Thirty tons of ferrom came in from what was Czechoslovakia and five ferrochrome from Swed teen tons of steel tubes and of steel bars were recei Sweden.

Urges Utilities To A

On Power for Defen

■ Assuring leaders of the electric industry that e power for war-time requ "can be made available much disturbance to exis tems, and at a very reaso penditure," M. W. Smith, of engineering, Westinghc tric & Mfg. Co., outlined a link the country's power s an address before the rec west Power conference, Ch

He suggested private uti ordinate efforts in tying

...pacity between important ...ers in an economically prac... manner, "using present ... facilities and equipment ...ectively, and thus preclude ...sity of special government... ...l trunk lines."

...rned that, if the industry ...inates too long the best ...may not be available when ... for a final decision arises, ... consequence that some ...njustified and unnecessary ...may be forced through by ...ring political authority but ...xperience."

...dish Stainless Weak

...ork—Weakness in stainless ...ducts is reported in the ...vian market. The market ...less sheets has been 2.75 ... kroner per kilo but more ... the price has sagged to 2.54 ...days evidence of further ... Swedish sources have ...tainless sheet bars in the ... market at 1.20 kroner per ...e exchange rate on the ... approximately 24.15c.

...derstood that Germany, un... ...ew subsidy plan, will make ...r cent of the selling price, ...teel sold in the export mar...

...e of Industry

(*Included from Page* 31)

...nts; E. F. Martin, super... ... of Grey mills, Saucon ...s been made assistant su... ...ent, Saucon plant; C. A. ...ssistant superintendent of ...lls, becomes superintendent ... mills.

♦

... P. Murphy, president, ... Railway Equiment Mfg. ...ago, has donated $6,500,000 ...western university, Evan... ... in the name of the Walter ...hy Foundation, an Illinois ...on set up to build and equip ...chnology unit.

♦

...s W. Martin, formerly of ...Forge Co., has joined the ... Basin Iron Works, Brook... ..., and will take over duties ...ant's forge department.

♦

... R. Earl, for a number of ...roduction manager, Con... ... Steel Corp., Los Angeles, ... elected a vice president.

♦

... Montgomrey, assistant sec... ...nce 1920, Institution of Me... Engineers, (Great Britain), ... appointed secretary. He succeeds Brigadier-General Magnus Mowat, who retired because of ill health.

♦

Vernon Whiting, Dallas, Tex., has been appointed sales representative in northern section of Texas for Stearns Magnetic Mfg. Co., Milwaukee.

♦

W. S. Kirkpatrick, formerly distributor for Brunswick-Kroeschell Co. and Carrier Corp., has been appointed supervisor of commercial refrigeration and air conditioning, with headquarters in London, England, by International Standard Electric Corp., subsidiary of International Telephone & Telegraph Corp., New York.

♦

Victor Brook, 433 Rockingham street, Rochester, N. Y., has been appointed exclusive representative in the Rochester, Buffalo, and Jamestown, N. Y., area, by Hall Planetary Co., Philadelphia, maker of precision thread and hole milling machines.

♦

Louis J. Borinstein, of A. Borinstein, Indianapolis, has been named chairman, legislative committee, Institute of Scrap Iron and Steel Inc., New York. Saul S. Frankel, Rochester Iron & Metal Co., Rochester, N. Y., has been made vice chairman.

♦

H. W. Weimer has opened a new "V-Belt Shop" at 2412 West State street, Milwaukee. In addition to Shafer bearings and other products, he will handle Allis-Chalmers Mfg. Co.'s Texrope V-belt drives.

♦

Hermann Waker, since 1930 vice president, American Bosch Corp., Springfield, Mass., and associated with Bosch interests 30 years, has resigned.

♦

J. C. Springer, associated with Cutler-Hammer Inc., Milwaukee, since 1928, serving several years with the company's Cleveland sales office, and the past seven years in the Milwaukee sales office, has been named assistant credit manager.

♦

Byron A. Fay, vice president in charge of production, Electric Auto-Lite Co., Toledo, O., has been elected a director.

♦

H. E. Adelsberger, president, Auto City Plating Co., Detroit, has been elected president, Plating and Rustproofing Association of Michigan.

♦

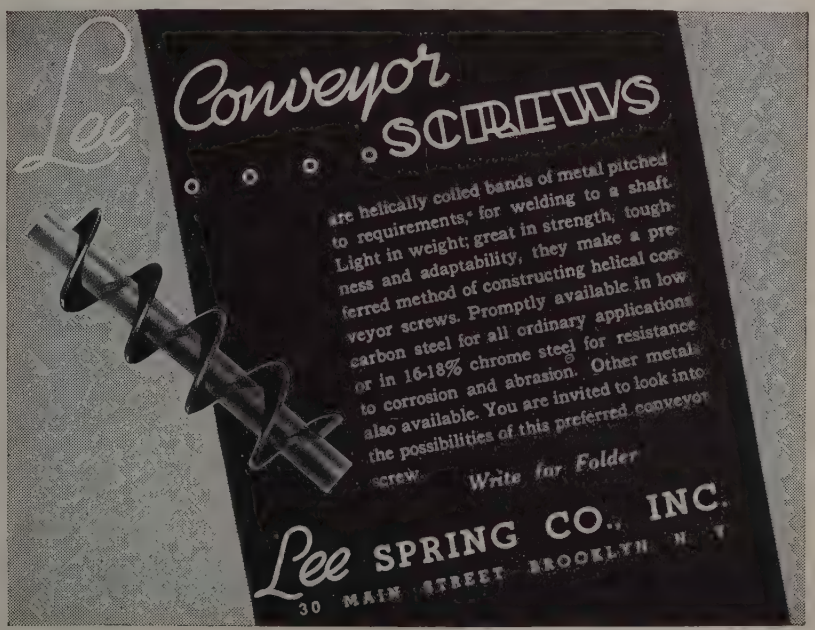
Russell A. Blanchard has been appointed Detroit district sales representative, Extruded Metals Inc., Belding, Mich. Mr. Blanchard formerly served as purchasing agent, Detroit Brass & Malleable Works, 14 years, and prior to that was director of purchases, Charcoal Iron Co. of America.

♦

Mark G. Mueller, representative in Colorado, western Nebraska, northern New Mexico and Wyoming for Ward Leonard Electric Co., Mount Vernon, N. Y., maker of electric controlling devices, is now located at 1644 Blake street, Denver.

♦

Frank F. Russell has been elected president, National Aviation Corp., succeeding Edward O. McDonell, who has been made chair-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are helically coiled bands of metal pitched to requirements, for welding to a shaft. Light in weight; great in strength, toughness and adaptability, they make a preferred method of constructing helical conveyor screws. Promptly available in low carbon steel for all ordinary applications or in 16-18% chrome steel for resistance to corrosion and abrasion. Other metals also available. You are invited to look into the possibilities of this preferred conveyor screw.
Write for Folder
Lee SPRING CO., INC.
30 MAIN STREET BROOKLYN N Y

man of the board. S. F. Christy has been named secretary and assistant treasurer.

♦

John F. Callahan, since 1921 a member of the advertising staff of Air Reduction Sales Co., New York, has been appointed assistant advertising manager.

♦

Frank M. Smith, vice president and general manager, Stout Engineering Laboratories Inc., Dearborn, Mich., has been elected to the board of directors of Hupp Motor Car Corp., Detroit.

♦

Jesse Marsten has been elected a vice president, and Harry A. Ehle, assistant to the president, International Resistance Co., Philadelphia. Mr. Marsten will continue as chief engineer, a position he has held many years, while Mr. Ehle, in addition to his new duties will remain in charge of industrial division sales.

Nonferrous Metals

New York — Uncertainties arising from the European crisis continued to dominate developments in nonferrous markets last week. Due mainly to sharp increases in war risk insurance rates and possible increases in the immediate future, sellers were reluctant to offer tin futures and prices moved higher. Weakness in London, coupled with dull demand here, resulted in a further cut of ¼-cent in smelters' quotations for electrolytic copper. Buying in all metals tapered because of unwillingness to make more than necessary commitments in the face of growing tenseness in Europe.

Copper — Smelters lowered prices to the basis of 10.50c, Connecticut, for electrolytic, while primary mine producers held quotations unchanged at 10.75c. Expo sold as low as 10.10c, c.i.f. ports, and closed near the l refined stocks of copper 13,277 tons further duri to 506,391, the highest s 1938. Domestic stocks 11,538 tons. Brass mill are holding steady at abo cent of capacity.

Tin — Some improve noted in tin sales as showed increasing conc their reserves in case of n tilities on the Continent spot advanced steadily fr early in the week to a around 46.70c at the clos

Lead—Most sellers of le their daily intake on busin was placed by consumers day after all the day's dev were reviewed. Prices we $2 per ton on Tuesday to of 4.60c, East St. Louis.

Zinc — Although daily ports were generally disa it was estimated that a tonnage, possibly 2000 booked during the week. low prices in London pre mestic producers from their quotations to a m able level. All sellers c quote on the basis of 4.50c western.

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Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finished Machined, Heat Treated to Specifications ...Forging Quality Ingots, Pressed or Hammered Billets.

Die Blocks & Piston Rods

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.

April	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	A m Ar Spot
8	10.75	11.37½	10.00	46.15	46.15	4.85	4.70	4.50	20.00	1
10	10.75	10.87½	10.00	46.20	46.20	4.85	4.70	4.50	20.00	1
11	10.75	10.75	10.00	46.00	45.85	4.75	4.60	4.50	20.00	1
12	10.50	10.75	10.00	46.25	46.10	4.75	4.60	4.50	20.00	1
13	10.50	10.75	10.00	46.50	46.50	4.75	4.60	4.50	20.00	1
14	10.50	10.75	10.00	46.70	46.70	4.75	4.60	4.50	20.00	1

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.75c Conn. copper

Sheets

Yellow brass (high)	16.98
Copper, hot rolled	18.87
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	19.73
Seamless copper	19.37

Rods

High yellow brass	12.31
Copper, hot rolled	15.37

Anodes

Copper, untrimmed	16.12

Wire

Yellow brass (high)	17.23

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	5.87½-6.12½
Cleveland	6.75-6.87½
Chicago	6.25-6.50
St. Louis	6.00-6.25

Heavy Copper and Wire

New York, No. 1	7.87½-8.00
Cleveland, No. 1	7.87½-8.00
Chicago, No. 1	7
St. Louis	

Composition Brass Bor

New York	

Light Copper

New York	6
Cleveland	
Chicago	
St. Louis	

Light Brass

Cleveland	
Chicago	
St. Louis	

Lead

New York	
Cleveland	
Chicago	
St. Louis	

Zinc

New York	
Cleveland	
St. Louis	

Aluminum

Borings, Cleveland	
Mixed, cast, Cleveland	
Clips, soft, Cleveland	
Mixed cast, St. Louis	

SECONDARY METALS

Brass ingot, 85-5-5-5, less carl	
Standard No. 12 aluminum	

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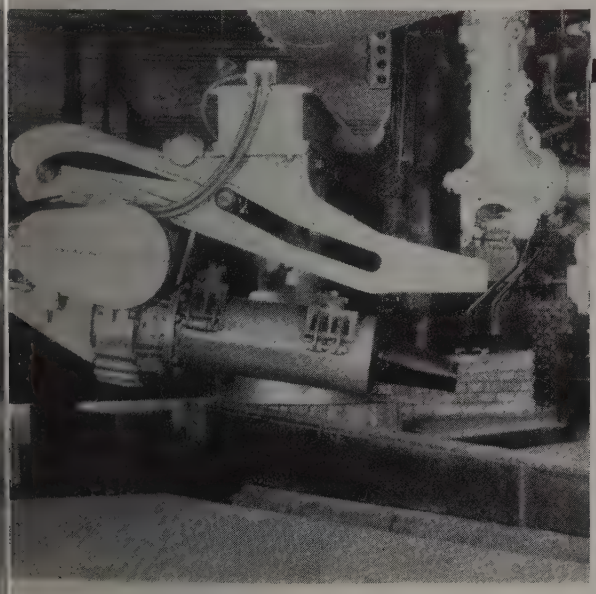

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A STRONG FRONT IS SECURED

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NO INTERRUPTION TO STEADY STOCK DESCENT

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LONGEST LIFE AND LEAST MAINTENANCE

A. BRASSERT & COMPANY 310 So. Michigan Avenue CHICAGO

Equipment

Chicago—Machinery interests report actual business booked last week was little changed in volume, but inquiries have slipped off noticeably, presaging quiet in the next few weeks. Sentiment among buyers is suffering from effects of the foreign situation and the stock market. April sales of equipment will be less than in March, it is freely forecast.

Washington—The navy awarded contracts April 12 totaling $487,000 for electric overhead traveling cranes for various navy yards. The largest order, $348,212, went to Harnischfeger Corp., Milwaukee, for cranes for yards at Puget Sound, Boston, Charleston, Brooklyn, Norfolk and Philadelphia. Other contracts included one to Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., two 175-ton cranes for the Philadelphia yard, $125,600.

Seattle — Mining operators are buying seasonal requirements. Electrical and pumping equipment and road machinery are in good demand. Bonneville authority has opened bids for 4150 feet of galvanized steel pipe and fittings, 3300 feet of wrought steel pipe, weight bars and for furnishing three heavy duty winches and 10,500 feet of steel wire rope and chokers. Same office has called the following: April 21, switchboards for five substations, No. 242; ground wire, rods, connectors, etc., No. 241; April 22, 475,000 feet wire and fittings, No. 258; April 24, bus and ground materials for substation, No. 255; May 1 for construction of substation and underground ducts.

Construction and Enterp

Ohio

CINCINNATI—Standard Oil Co. has plans in progress for constructing a centralized distributing plant at estimated cost of approximately $400,000.

GREEN SPRINGS, O.—Village, Ira Young, mayor, is completing plans and will soon receive bids, to be due about April 28, in waterworks improvement project costing $45,000. Consulting engineer, Floyd Browne, Marion, O.

HUBBARD, O.—City, C. F. Harder, clerk, is completing revised plans for constructing a waterworks costing about $52,000. Involves water softening plant, two deep well turbines, centrifugal pumps, wash pumps, mains, filters and chemical equipment. Consultant, E. D. Barstow, Akron, O.

MILAN, O.—Village, H. C. Moore, mayor, has approved bond issue and is preparing plans to construct an Imhofftype sewage treatment plant costing approximately $120,000. Clarence Voight, Sandusky, O., consulting engineer.

PIQUA, O.—City, R. V. Buechner, manager, will probably soon advertise for bids in installation of miscellaneous power plant equipment costing $26,000. Albert Schroeder, city engineer.

Connecticut

MERIDEN, CONN. — International Silver Co. is receiving bids in construction of a two-story, 50 x 60-foot boiler plant costing approximately $40,000.

STORRS, CONN.—State, R. A. Hurley, commissioner of public works, Hartford, Conn., has revised plans and will soon take bids for building a brick, steel and concrete central heating plant costing $160,000. PWA project. F. J. Dixon, Hartford, engineer.

Rhode Island

PAWTUCKET, R. I.—City water filtration commission, Mayor T. P. McCoy, chairman, is asking bids due April 24 in the construction of a tion plant costing $500,000 allotted. C. A. McGuire R. I., consulting engineer.

Pennsylvania

ERIE, PA.—City, Charles mayor, has completed plan fications for projected cons chlorination plant, containin ating tanks, to cost $17,000 Aitken, city engineer.

Michigan

DETROIT—Divco Twin T awarded contract to W. H 4649 Humbolt avenue, for a one-story, 248 x 500-foot estimated to cost approxim 000. Considerable equipmen stalled. (Noted Feb. 6.)

PORTLAND, MICH.—Tri- tric Co-operative Inc., Dolph intendent, is completing pl be ready for bids about M struction of 95 miles r power lines in four counti $100,000.

ROCHESTER, MICH.—V Ennis, clerk, asks bids u in the proposed construction sewage treatment plant cost about $87,500. PWA f Ayres, Lewis, Norris & May Mich., consulting engineers

Illinois

AURORA, ILL.—Austin-W Machinery Co. is taking posed construction of a p about $50,000. E. O. Sessio cago, consulting engineer.

CHICAGO—Comstock Sta been organized with 1000 s value common stock to and distribute iron and ste metals. Correspondent, Pa North La Salle street.

NEWTON, ILL.—Norris operative has been allotte loan by REA for construct miles of rural electric pow sion lines through six coun

Alabama

MOBILE, ALA.— City, C hauer, mayor, receives bids installing complete convey bulkhandling plant, Alabam J. B. Converse & Co. Inc gineer.

District of Columbia

WASHINGTON — Navy yards and docks, asks bids for a 25-ton diesel electr crane for installation in S. C., navy yard. Spec. 8992

Mississippi

PASCAGOULA, MISS.—Ja board of supervisors will ta 1 for building a 150,000-gall tank and furnishing variou for water system. L. C. Wi cagoula, consulting engineer

Virginia

PEARISBURG, VA.—Celan America, W. M. Cameron, e president, 180 Madison a York, will soon let contra

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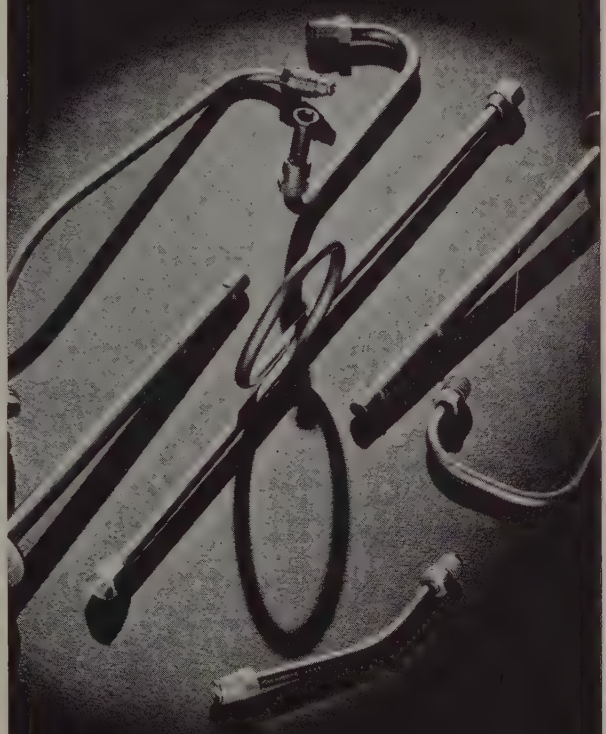

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structing the first unit, costing $750,000, in its projected $10,000,000 plant.

Missouri

AFFTON, MO.—City has $178,517 WPA grant in the projected construction of a complete sewerage system and sewage disposal plant at estimated cost of $218,-391.

KIRKWOOD, MO.—City is taking bids to 10 a. m., April 21, on constructing one-story power plant, installing sub-station transformers, switchgear, regulators, wiring and voltage regulators. Black & Veatch, Kansas City, Mo., consulting engineers. (Noted April 3.)

REPUBLIC, MO.—City, H. Owen, mayor, plans to build a sanitary sewerage system and complete sewage disposal plant at total cost of about $90,-000. J. Robinette, Springfield, Mo., consultant.

SPRINGFIELD, MO.—Laclede County Electric co-operative has been allotted $158,000 REA loan for constructing 152 miles of rural electric power transmission lines through five counties.

Wisconsin

BOSCOBEL, WIS.—Tri-state Power co-operative has plans underway for building in five counties rural power lines whose cost will total $478,000.

Minnesota

HALSTAD, MINN. — Village, Anthony Opgrand, clerk, takes bids to 2:30 p. m., April 25, for constructing a power plant with diesel engine generating equipment, switchgear, distribution system and auxiliaries. Certified check 5 per cent to accompany bid. Engineers, G. M. Orr & Co., Minneapolis. (Noted Jan. 23.)

RED LAKE FALLS, MINN.—Red Lake co-operative has appointed Ellerbe & Co., St. Paul, consulting engineers, in project for constructing about 240 miles of rural electric power transmitting lines. (Noted March 13.)

RED WING, MINN.—City board of water commissioners, S. T. Irvine, clerk, takes bids to 7:30 p. m., April 25, in the projected installation of a 312-kilovolt amperes alternator and motor for water pumping service. Certified check 10 per cent to accompany bids. J. F. Enz, city engineer.

STEWARTVILLE, MINN.—Village, G. W. Ellis, recorder, receives bids until 2 p. m., April 21, on construction of a sewage treatment plant and pumping station. Certified check 15 per cent to accompany bid. Druar & Milinowski, St. Paul, consulting engineers.

WORTHINGTON, MINN.—City, G. S. Thompson, clerk, is accepting bids to 8 p. m., April 26, for furnishing and installing in its power plant a new turbo-generator, condenser, switchgear and auxiliary equipment. Certified check 10 per cent to accompany bid. Ralph D. Thomas & Associates, Minneapolis, consulting engineers.

Texas

CONVERSE, TEX.—Guadalupe Valley Electric co-operative, M. G. Prochnow, representative, is asking bids in construction of 198 miles of rural power transmission lines in four counties at cost of about $157,000. Has REA allotment. W. G. Morrison, Waco, Tex., consultant.

HOUSTON, TEX.—Bethlehem-International Supply Co. has awarded contract to Southwestern Construction Co., 3802 Calhoun street, for building a 264 x 320-foot warehouse. Will install four overhead electric cranes. W. L. Kane, resident engineer.

Nebraska

WYMORE, NEBR. — City, H. Janke, commissioner, is preparing plans for improving its power plant at estimated cost of $150,000. E. H. Dunmire, Lincoln, Nebr., consulting engineer.

Kansas

FT. RILEY, KANS.—Construction quartermaster, Ft. Riley, is taking bids due April 24 for three 7½-kilov transformers and one 75-kilov unit.

KANSAS CITY, KANS.—Fo will build a 140 x 360-foot building costing $660,000. Ma W. F. Schulz, Memphis, Ten ing engineer.

Iowa

CALLENDER, IOWA—Cit bids to April 21 on projecte tion of a waterworks syste deep well, tank, and pump h Engineering Co., Webster consultant.

DUNCOMBE, IOWA — City Brown, clerk, takes bids un May 12, on power system volving: Section 1, new swite Section 2, electrical distribu complete with meters and a

MUSCATINE, IOWA—City erect a 300,000-gallon wate relocate present pumping eq laying new water mains. Es is $37,177. Seeks federal fu

Montana

LEWISTOWN, MONT.—Cit Waltz, clerk, takes bids to 8 20, on constructing complete posal plant, estimated to Certified check 5 per cent to bid. J. M. Schmit, city engin Feb. 27.)

Pacific Coast

BURBANK, CALIF.—Chica ic Tool Co., Chicago, propo struct and equip a factory cipally for supplying the dustry.

BONNEVILLE, OREG.—U engineer is receiving bids for circuit breakers, acce parts for the powerhouse a dam. Inventory 694-39-123.

PORTLAND, OREG.—Bonn project, 811 Northeast O takes bids until April 20 panel circuit breaker, swit charger, relays etc., for Nort Wash., power substation. In

SEASIDE, OREG.—City, G auditor, will receive bids constructing Unit 2 in its posal plant project, at estim $80,000. Stevens & Koon, Po consulting engineers.

WESTPORT, WASH.—Vot proved proposal to issue $ for financing construction of reservoir and distributing s

Canada

CALGARY, ALTA.—Imper Sarnia, Alta., is completin building a refinery costin Propose to begin work this

NEW TORONTO, ONT.— dustries Ltd., Montreal, Que ing its fabrikoid plant and solvents recovery system approximating $150,000.

TORONTO, ONT.—Willys Ltd., Windsor, Ont., is nego site for constructing projec plant to cost $150,000.

CHICOUTIMI, QUE.—Alun Canada Ltd., Montreal, Qu receive bids in the project tion of a factory costing $

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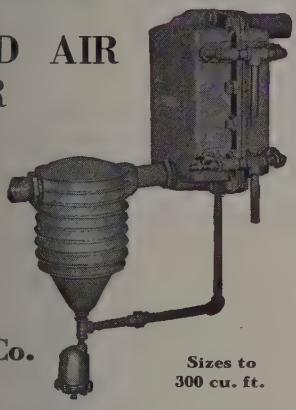

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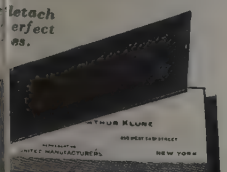

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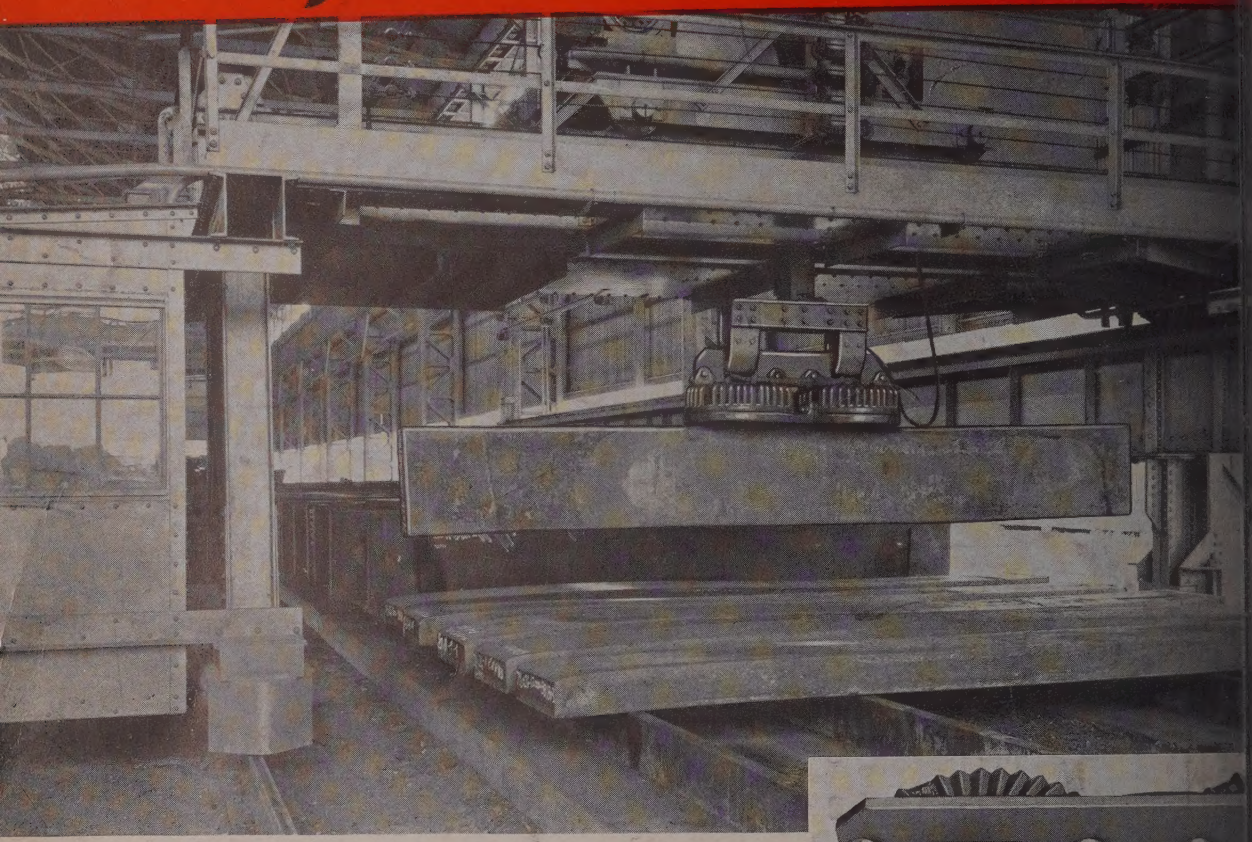

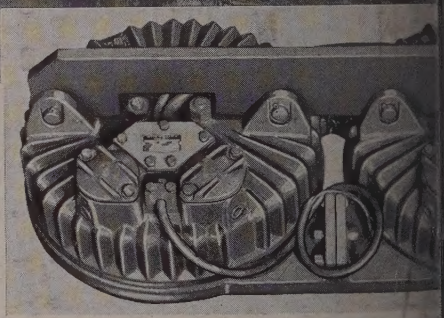

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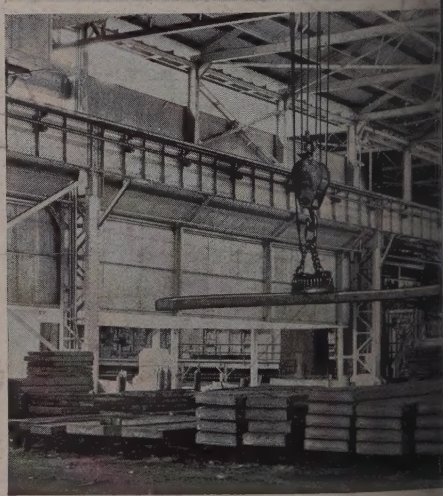

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